

# COMPUTERWORLD

## 'All systems go' for desktop launches

Apple System 7.0 seeks window of opportunity

BY JAMES DALY  
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. will deliver on a 2-year-old promise next Monday when it releases System 7.0, a snappy rejuvenation that will serve as fresh ammunition in the company's battle with Microsoft Corp.'s Windows 3.0 environment.

The new package — Apple's first major operating system upgrade for the Macintosh line in almost three years — boasts a variety of improvements, including a revamped scalable font technology called TrueType. Other highlights include multitasking, file sharing, virtual memory, 32-bit addressing and improved Help capabilities.

Packing System 7.0 with features, however, had its price: Apple missed its original deliv-

ery date by more than one year.

The delay realigns System 7.0's mission to one of combating the enormous popularity of Windows 3.0, analysts said. "System 7.0 will help preserve Apple's installed base, but if it was out when it was supposed to be out, it might have helped slow the incursion of Windows," said

*Continued on page 109*

Tools to bring new life to DOS in Release 5.0

BY JAMES DALY  
CW STAFF

Two years after forecasting the demise of DOS, Microsoft Corp. is in the final stages of producing a major upgrade to the resilient operating system, a reinvigorat-

ed edition that is expected to be announced June 11 in New York.

DOS 5.0 will offer several advantages over the problematic and highly criticized DOS 4.0, including expanded utilities, enhanced Windows performance and increased memory-management capabilities. The update is expected to be priced at less than \$100 when it is unveiled.

Since last fall, more than 7,000 beta-test users worldwide have tinkered with DOS 5.0, a product originally deemed unnecessary with the introduction of OS/2. "One thing we learned from the success of Windows is that DOS lives," Microsoft Vice President Brad Silverburg said. "There will be a Version 6.0 and a Version 7.0 as well — DOS has a long life ahead of it."

Early users of DOS 5.0 said they found it not only stable and reliable but also a quantum leap over earlier DOS editions.

*Continued on page 109*

### Near-term directions

Operating system upgrades from Apple and Microsoft are said to have a number of key features long desired by users

#### Apple

- File-sharing between Appletalk-connected Macs.
- Pop-up Help facilities.
- TrueType font display.
- Store files in more than one location.
- Virtual memory support, 32-bit addressing.
- Multitasking that allows several applications to run simultaneously.



#### Microsoft

- Ability to address memory above 640K.
- Ability to be loaded in either upper or high memory.
- Enhanced DOS shell resembling Windows file manager.
- Text editor and new utilities.

## DG finds profit with balance of technology and business

BY SALLY CUSACK  
CW STAFF

WESTBORO, Mass. — Defying the gloomy predictions of analysts, Data General Corp. has racked up two consecutive profitable quarters, culminating recently in a \$19.2 million profit after almost six years of red ink.

However, analysts and users are waiting to see if DG's modest string of victories is the real McCoy or simply a carefully crafted illusion of financial health.

They are also watching to see if Ronald Skates, DG's president and chief executive officer, and Senior Vice President J. Thomas West may have overcome an initial distrust of one another to create the financial and technological balance that has long eluded DG.

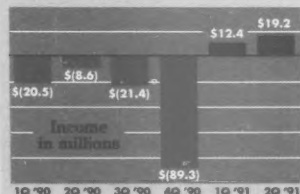
With the departure of company founder Edson de Castro earlier this year, West is the second most visible person at DG as head of the Advanced Systems Development Group.

Allowing that DG was "never product-deficient," William J.

*Continued on page 16*

### Put away the red ink

Data General Corp. Chief Executive Officer Ronald Skates has turned the company's fortunes back to the black



Source: Data General Corp.



CW Chart: Doreen St. John

## Novell's impact narrow in wide area

BY JOANIE M. WEXLER  
and JIM NASH  
CW STAFF

As a growing number of firms construct corporatewide networks, Novell, Inc. is outfitting its Netware network operating system with wide-area accoutrements.

While users are encouraged by such moves as multiprotocol support on Novell servers and a network domain naming service, many complained that several loose ends are dangling in Novell's enterprise support.

Last June, Novell announced Netware 386 Communication Services, an application program interface between the Netware operating system and Netware Loadable Modules, or applications.

However, until Communication Services ships, "I don't consider the positioning of Netware 386 as an enterprise-wide network operating system a true statement," said Ray Chandler,

senior network consultant at the Arco Oil and Gas Co. research center in Plano, Texas.

Novell said it expects the interface to support much of its high-end connectivity among personal computer networks and from networks to hosts. Users and industry analysts have said the first module for the interface will be Netware for IBM's Systems Application Architecture, which sources in and outside of Novell said will be delivered this month (see story page 51).

Novell's strategy behind its push for enterprise-wide status can be summed up as integration, said John Edwards,

*Continued on page 107*

## Suit seeks to define user rights

BY MICHAEL ALEXANDER  
CW STAFF

AUSTIN, Texas — The Electronic Frontier Foundation is funding a lawsuit against the federal government that some legal experts said will be the first test of whether constitutional protections apply to electronic bulletin boards and the privacy of electronic mail.

### Privacy issues

► Prodigy on-line service says it doesn't review a file that contains fragments from user disks. Page 4.

The EFF is an advocacy group co-founded by Mitch Kapor, who is a co-founder of Lotus Development Corp., and John Barlow, a lyricist and author.

"If you are a poor bulletin board operator, you don't know ultimately whether you have the same panoply of constitutional rights that a print journalist has," said Sheldon Zenner, an attorney at Katten, Muchin & Zavits in Chicago. "That puts you at some risk. From a bulletin board operator's perspective, this is a precedent-setting lawsuit."

"What I think the EFF has done is, in an effective and timely

*Continued on page 4*

## INSIDE

**It's sale days at DEC,** with the computer maker slashing prices for VAX 6000 systems and upgrades by 18% to 69%. Page 6.

**Working overtime:** The U.S. Department of Labor isn't finished with the programmer overtime pay controversy, judging by public comments about it. Page 8.

**Product Spotlight** — Go beyond the glitz to the true usefulness of superservers. Page 73.

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- 6 Signet passes the burden of responsibility for its IS and networking groups onto the willing shoulders of out-sourcer EDS.
- 8 The computer industry claims what's confusing is not the overtime law but rather the law backer, the Labor Department.
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## Quotable

**"One thing we learned from the success of Windows is that DOS lives."**

BRAD SILVERBURG  
MICROSOFT

On the coming introduction of DOS 5.0. See story page 1.

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# EXECUTIVE BRIEFING

■ **The future may be now for future desktop operating systems.** Developments are breaking in the various arenas. The two-year wait for the new release of the Apple Macintosh operating system, System 7.0, is expected to end next week when that software is introduced. **Page 1.** The latest edition of Microsoft's MS-DOS, scheduled for release next month as DOS 5.0, has been beta-tested by about 7,000 users, some of whom say DOS 5.0 offers much of what you would get with OS/2. **Page 1.** Speaking of OS/2, IBM has no sooner cleared up some of the confusion about where it is going with OS/2 Release 2.0 than people have started questioning what IBM will do about a so-called portable OS/2. **Page 109.**

■ **There are two approaches to distributed DBMSs: "True" distributed DBMSs, which support location transparency, and client/server DBMSs, which do not.** Which one is right for your distributed computing needs? The former is best for firms with physically separate but logically integrated processing setups, while the latter works well in high-performance, high-transaction rate situations. **Page 81.**

■ **As impressive as the size of the crowds may have been, what made the Association for Information and Image Management conference interesting last week was the attitude of the attendees: Users were actually looking to buy equipment.** **Page 10.**

■ **Superserver sales are forecast to grow in leaps and bounds during the next couple of years, but most consultants say the software isn't ready to take advantage of their power.** Meanwhile, RISC servers have superservers beat in terms of performance. **Page 73.**

■ **A pair of privacy cases moved into the limelight last week.** First, operators of the Prodigy service acknowledged that they had the technical ability to read some private files on users' PCs, although officials say Prodigy has never done so. **Page 4.** Then, a lawsuit was filed against federal law enforcement officials with the backing of the Electronic Frontier Foundation, claiming that electronic bulletin board communications are protected by the First Amendment's freedom of speech provision. **Page 1.**

■ **MBA candidates are due to get a greater exposure to computers as business schools move to show**

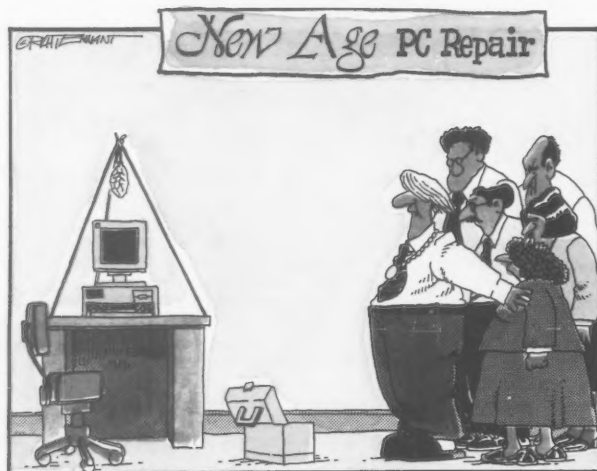
those future corporate leaders how information technology plays a role in all facets of modern commerce and business. **Page 65.**

■ **That programmer overtime pay controversy is still not settled.** Federal officials drafted regulations in March in an effort to carry out the law passed by Congress last year that limited overtime opportunities for programmers. By the time the period for public comment on the regulations closed last week, several organizations had found fault with the new rules. **Page 8.**

■ **Signet Banking Corp. made its outsourcing plans official last week, signing an operations management and systems development pact with EDS.** The Virginia-based bank hopes to save \$137 million during a 10-year period. **Page 6.**

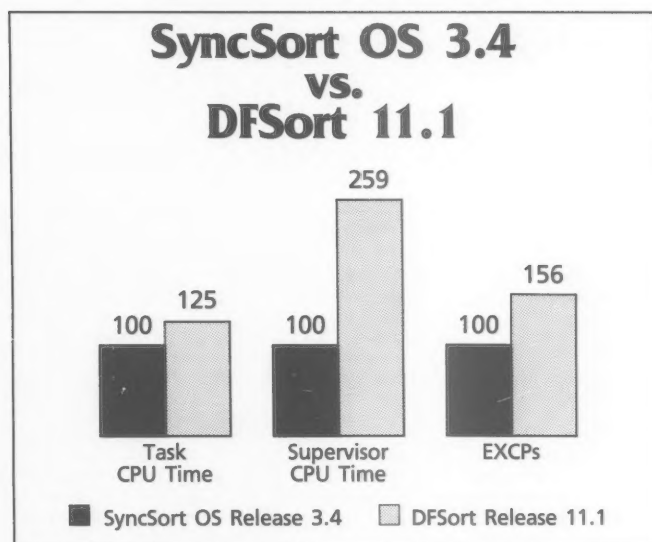
■ **On-site this week: Financial Guaranty Insurance Co. hopes to turn its years of sweat and toil on a new system into company profits by marketing its downsizing knowledge through a consulting group.** **Page 45.** The New York City Department of Environmental Protection is spending \$4 million up front to save \$2 million per year and provide better service through a state-of-the-art network. **Page 51.**

## The 5th Wave



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# File data upsets Prodigy users

Some customers find text from other programs in on-line service data file

BY CHRISTOPHER LINDQUIST  
CW STAFF

Some Prodigy users may have been looking over their shoulders for Big Brother after they examined a file created by the on-line service's software and discovered text from personal documents and programs.

Recent published reports and messages on several electronic bulletin boards indicated that some subscribers to the service have found fragments of program source code, letters and text from other programs in the STAGE.DAT file that Prodigy creates on the user's disk as part of its installation process.

Representatives of Prodigy Services Co., a joint venture of IBM and Sears, Roebuck and

Co., acknowledged that such information could find its way into the file, but they denied that the company was uploading or examining the data.

"We are not interested in anything on anyone's hard drive or any drive or in anyone's computer other than what is specifically connected with Prodigy," said Steve Hein, a Prodigy program manager.

Harold Goldes, another Prodigy program manager, said the bits of text that were discovered could have appeared in two ways. First, when the installation program creates the STAGE.DAT file, data present in the computer's memory could be incorporated into the file. So installing Prodigy after leaving a word processing application

could result in some of the recently edited text, still resident in memory, being added to STAGE.DAT.

Second, when STAGE.DAT is created, DOS allocates space on the disk to the file. Some of the space is overwritten by STAGE.DAT data, but the rest remains in its original state, which could include the contents of previously deleted files.

One privacy expert indicated that it was highly unlikely that Prodigy would face any legal repercussions.

"There is no evidence at all, so far, to indicate that Prodigy has ever uploaded information from users' hard disks, so there is no indication of any privacy problem," said Marc Rotenberg, director of the Washington,

D.C., office of Computer Professionals for Social Responsibility.

However, Richard de la Sota, a deputy district attorney at the Consumer Protection Division of the Los Angeles County District Attorney's office, confirmed that his department is currently involved in an investigation of Prodigy concerning both its electronic mail policy and the more recent concerns of the STAGE.DAT files, although he could release no details. De la Sota said a "significant number" of Prodigy users had called to complain about the service.

Goldes said a utility currently being written by Prodigy will allow its subscribers to erase all non-STAGE.DAT information from the files. Hein indicated that user questions are being answered as they are received, but he was adamant in stating that Prodigy did not believe there was a problem. "Perhaps people are fearful, but there are absolutely no grounds for fear."

## User rights

FROM PAGE 1

way, raised critical constitutional questions about computer use," said Marc Rotenberg, the Washington, D.C., office director of Computer Professionals for Social Responsibility. "They have taken head-on the government's contention that hackers are a breeding ground for computer crime."

Attorneys for Steve Jackson and three other plaintiffs filed a civil lawsuit last week in federal district court here alleging that federal authorities violated the Privacy Protection Act of 1980, the Electronic Communications Privacy Act and the First and Fourth Amendments to the U.S. Constitution.

Jackson is the president of Steve Jackson Games, Inc., a small publisher of fantasy role-playing games whose business was raided by federal authorities in March 1990. The other plaintiffs are New Hampshire residents Elizabeth McCoy, Walter Milliken and Steffan O'Sullivan, who said they were users of Illuminati, an electronic bulletin board system operated by Steve Jackson Games.

Named in the suit on five counts were the United States of America; the U.S. Secret Service; Timothy Foley and Barbara Golden (both special agents of the Secret Service in Chicago); William Cook, an assistant U.S. attorney in Chicago; and Henry Kluepfel, a district manager at Bell Communications Research, Inc. in Redbank, N.J. Kluepfel has assisted authorities in a number of investigations into the activities of outlaw hackers.

Cook and a spokesman for the Secret Service declined to comment on the case. A telephone call to Kluepfel seeking com-

ment was not returned.

Secret Service agents raided Steve Jackson Games in Austin on March 1, 1990 and seized personal computers (including one used to operate Illuminati), data disks and several other items. The agents also seized disks containing Generic Universal Role-Playing System (GURPS) Cyberpunk, a game book in a series of fantasy role-playing books published by Steve Jackson Games. The publication of the book, described by an agent as a "handbook for computer crime," was delayed for six weeks, Jackson said.

The suit alleged that although neither Jackson nor his company was charged with any crime, the federal law enforcers searched the business without sufficient probable cause and illegally seized property. Among many other allegations, the suit also charged that the seizures violated First and Fourth Amendment protections.

Jackson claimed to have suffered more than \$125,000 in lost revenue as a result of the raid and was forced to lay off eight employees, nearly half of his staff. Most of the equipment — some of which was allegedly severely damaged — was returned about three months later. Other equipment and paper copies of GURPS Cyberpunk have not been returned.

"This thing has aged me and damn near wrecked my business," Jackson said. "It also has forced me to spend more than a year on damage control instead of writing games."

The lawsuit is being led by the Boston law firm of Silvergate & Good. The EFF is picking up the tab, which is expected to go well into six figures, Kapur said. "Obviously, litigation is expensive, but we're prepared to see this all the way through."

## NRA's 'instant check' computer system nixed

BY MITCH BETTS  
CW STAFF

WASHINGTON, D.C. — For years, the National Rifle Association (NRA) has been trying to defeat gun-control legislation by promoting a nationwide computer system that could instantly check the criminal history of gun buyers. But last week, the NRA's computer plans were shot down — or at least wounded.

In the midst of a wily political battle over gun-control legislation, NRA opponents released a draft of a congressional study that concluded it would take five to 10 years to develop a workable computer system because state criminal histories are in bad shape and only partially automated. The U.S. Department of Justice said the same thing in a 1989 study [CW, Dec. 4, 1989].

The NRA is pushing its "instant check" bill as an alternative to the so-called Brady bill,

which requires a seven-day waiting period for handgun buyers. (The bill is named for James Brady, the former White House press secretary who was wounded by gunfire during an assassination attempt on former President Ronald Reagan in 1981.)

Rep. Edward F. Feighan (D-Ohio), sponsor of the Brady bill, said the draft report by Congress' Office of Technology Assessment shows that the NRA proposal "is really a phony alternative that can't be implemented in the near future" and is "just another NRA smoke-screen."

The NRA countered that its proposal, which mandates the creation of a felon identification system for use at the point of sale, has already proved workable in two states: Virginia and Florida.

According to the NRA, the draft of the study is riddled with errors because it was released prematurely.



### CORRECTIONS

A photo in the story "The road to lower fuel costs" [CW, April 1] was incorrectly identified as J. B. Hunt, Inc.'s Thomas Sanderson. The photo is of company founder J. B. Hunt.

In "Third-party software helps maximize RS/6000 power" [CW, April 15], the Lebanon, N.H., software vendor was incorrectly

identified as Computer Microsystems, Inc. The correct company name is Corporate Microsystems, Inc.

.....  
The maker of the Micro Control package used by Turner Corp. is Stamford, Conn.-based IMRS, Inc., not IRMS, as stated in "Turner rebuilds on PCs" [CW, April 15].

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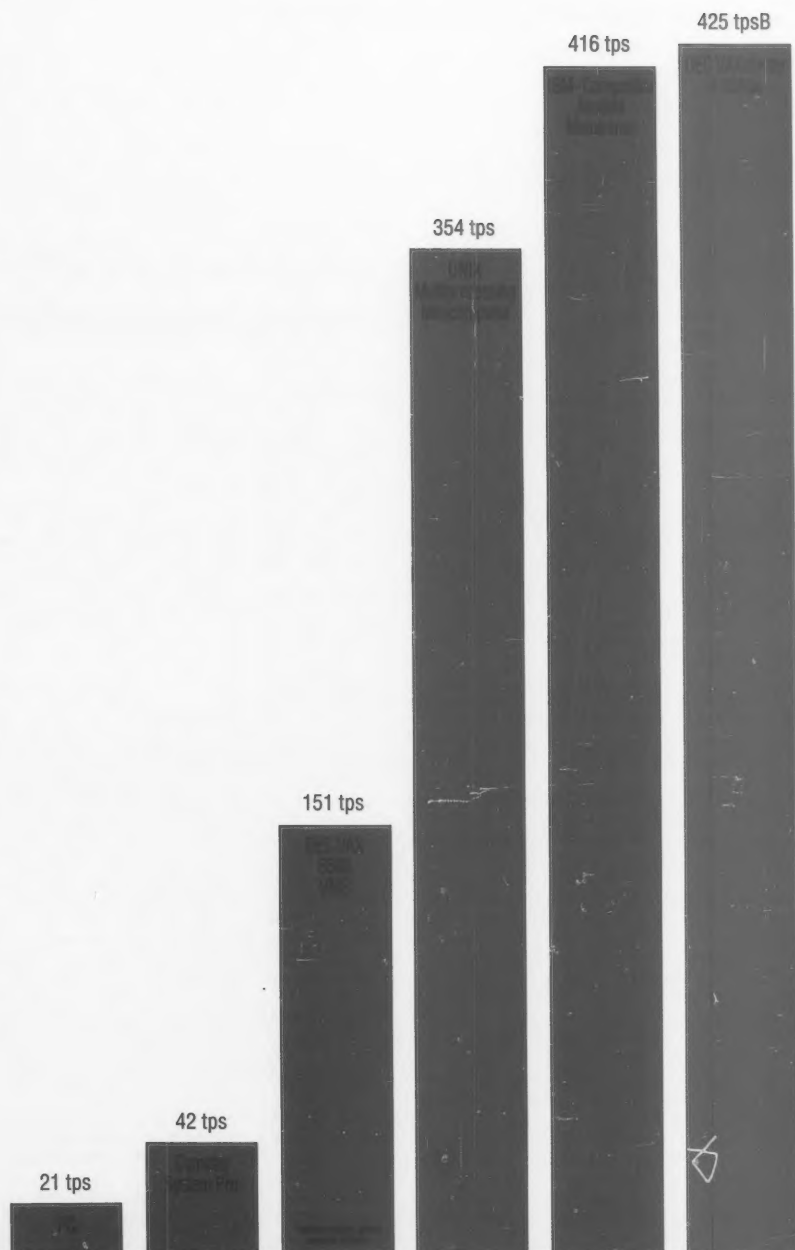
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# Prices cut on VAXs, upgrades

BY MARYFRAN JOHNSON  
CW STAFF

MAYNARD, Mass. — Beset by faltering sales on its premiere line of minicomputers, Digital Equipment Corp. took an ax to the VAX 6000 price list last week, chopping costs 18% to 69% for new systems and upgrades.

"This is great for customers. It's about time," said Dennis Morris, information service manager at the Lee County Board of County Commissioners in Fort Myers, Fla. The county is poised to upgrade its VAX 6000 Model 410 and buy a new Model 500 to run a countywide criminal justice system, and the price cuts surfaced at the perfect moment, Morris said.

"We're looking at a savings of \$150,000 to \$200,000, and that may put us in a position where, with an additional \$100,000, we could get another VAX 9000 [mainframe] instead," Morris said. He and other customers

said they expect DEC to follow the VAX 6000 repricing with a corresponding drop in VAX 9000 prices, which would bring entry-level prices for that line well below \$900,000.

Industry analysts agreed that price cuts are likely for the VAX 9000s, which will be introducing a midlife "kicker" this summer with 20% better performance. Yet the mainframe business has been agonizingly slow for DEC, which expected to sell at least 100 systems last quarter but sold only about 70.

DEC officials have acknowledged that revenue from the VAX 6000 series has been "disappointing" during the past few quarters, and analysts said the Model 500s have also been a tough sell. Smaller systems such as the VAX 4000 client/server computers are reportedly selling well, but their profit margins are much narrower than the high-end VAXs.

The price cuts on the VAX 6000 Model 500s ranged from

18% to 37%, bringing the cost bracket for those six models down to \$186,000 to \$561,000. For users who want to upgrade their VAXs from Model 300s and 400s to the high-end 500s, the costs were reduced by a

more startling 34% to 69%.

DEC also announced availability of three- and four-vector processors for the Model 500s, ramping up its supercomputer-like capabilities. The vector processors, each paired with a scalar processor, cost \$26,611 each.

A slow economy and hesitant high-end buyers were the key factors pushing DEC to improve

the price/performance of the VAX 6000s, said Pauline Nist, group engineering manager for the line. "Our goal is to motivate those people still sitting on the fence about spending this year," she said.

While DEC has sold 15,000 VAX 6000s since their mid-1988 debut, IBM has moved more than 100,000 Application System/400 midrange systems during that same time frame. However, DEC officials denied any connection between the firm's price-cutting action last week and the April 22 introduction of new, aggressively priced AS/400s.

The DEC bureaucracy simply cannot move that quickly, Nist said. Analysts said DEC was forced to act because its sales force was losing more competitive battles over price.

"IBM and DEC are both going after the same new business, and I would guarantee that users will see discounting on top of these price cuts," said Karlyn Kilroy, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. "This is definitely like the PC price wars."

## Pricing perks

Price reductions in the VAX 6000 line have made it easier to purchase a new system as well as upgrade an existing one

SYSTEMS					
VAX 6000	Old price	New price	Percent reduction		
Model 560	\$811,000	\$561,000	31%		
Model 530	\$523,000	\$336,000	36%		
Model 510	\$227,000	\$186,000	18%		

UPGRADES					
VAX 6000 upgrades from	to	Old price	New price	Percent reduction	
Model 510	520	\$184,000	\$100,000	46%	
Model 410	510	\$129,000	\$90,000	30%	
Model 310	320	\$127,000	\$40,000	69%	

Prices are U.S. list prices and include the cost of the VMS operating system license with a one-year product warranty

CW Chart: Doreen St. John

## DEC releases low-end Unix machine

BY MARYFRAN JOHNSON  
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. unveiled its latest low-end Unix-based workstation last week, advertising the system as the first machine to comply with the Advanced Computing Environment (ACE) guidelines.

Industry analysts dismissed the ACE connection as market posturing on DEC's part, saying the machine had been in the pipeline for months anyway.

"Digital didn't have to change much to make an ACE-compliant product," said Terry Shannon, an analyst at International Data Corp. in Framingham, Mass. "The only real difference with

this system is the CPU sits on a daughterboard, which makes it upgradable."

### Dual strategy

The 1-month-old ACE alliance of 21 computer vendors — led by DEC, Compaq Computer Corp., Microsoft Corp., Mips Computer Systems, Inc. and The Santa Cruz Operation — is backing a dual-desktop strategy to support personal computers based on Intel Corp.'s 80386 and I486 chips and reduced instruction set computing systems based on Mips' R3000 chip.

The Decstation 5000 Models 120 and 125, priced at \$6,495 and \$8,495, respectively, are based on the Mips R3000 chip and run DEC's Unix operating

system variant, Ultrix 4.2.

The ability to upgrade Decstation 2100s and 3100s to this new low-end Decstation 5000 is more likely to pique customer interest than is the ACE connection, said Ken Krallman, MIS director at Carleton Technologies, Inc. in Orchard Park, N.Y.

"That board is the key to the whole product," Krallman said. "Instead of talking about \$8,000 to \$10,000 for a change in workstation, you can start giving these boxes some lifetime with an upgrade."

Some customers were glad to see DEC supporting the ACE initiative so publicly, however, because ACE will provide a clear migration path for their current Ultrix applications.

There will be a reduced instruction set computing and PC operating system version from The Santa Cruz Operation as well as Microsoft Corp.'s OS/2 3.0 for the two platforms. Other operating systems may also be considered.

With the wide choice and interoperability promised by ACE, Donald Gaubatz, group manager for workstation engineering at DEC, said he expected consumers to buy from one vendor rather than picking among the offerings. He said he expected that vendor to be DEC.

Gaubatz's comment was similar to comments from other ACE members.

The consortium members are working together loosely to achieve a common goal.

## Signet enters contract with EDS for outsourcing service

BY ELISABETH HORWITT  
CW STAFF

RICHMOND, Va. — Signet Banking Corp. signed a contract last week that outsources its information systems and networking operations, as well as key systems development initiatives, to Electronic Data Systems Corp. (EDS).

Outsourcing seemed the right decision, "considering the state of banking today, with the real-estate environment, bank performance and the need to minimize the risk of not being able to accomplish the objectives on time," said William Dieter, executive vice president of the bank's Systems and Operations Services Group.

The bank anticipates saving approximately \$137 million in hardware, software and systems support costs during the next 10 years, Dieter said. The second major benefit expected from outsourcing, he added, is slicing about two years off of the time it takes to implement certain strategic systems initiatives.

Signet chose EDS over IBM and Systematics, Inc. — its chief competitors in the bidding process, according to Ladd Willis, managing vice president at First Manhattan Consulting Group in New York. First Manhattan was brought in early to advise the bank during the outsourcing evaluation process.

"One of our up-front qualifications was for someone with ex-

perience in financial services and banks of our size," Dieter said. "EDS has had many years of experience with such companies, most recently with First Fidelity [Bancorp]."

One initiative to be undertaken involves integrating the bank's disparate collection of applications onto a single software platform. EDS proposed migrating existing applications to Software Alliance Co.'s Reliance 2000 application set over a period of 12 to 18 months, Willis said.

### Other issues

EDS will also take responsibility for Signet's planned migration from a combination of Unisys Corp. and IBM hosts to IBM computers. EDS will assume Signet's existing Unisys leases so the bank will not have to worry about how to phase in its IBM purchases, according to Willis.

The contract calls for the bank's IS employees to be rehired by EDS, which will assume operation of the bank's data center here. Jobs were guaranteed for all 270 employees, but approximately 10% have opted to retire, leave or take jobs elsewhere in the company, Dieter said.

The bank's information services group had recommended in November 1990 that management evaluate the potential benefits of outsourcing over in-house development [CW, Dec. 10, 1990].

## ACE predicts larger membership in future

BY J. A. SAVAGE  
CW STAFF

SAN FRANCISCO — Members of the Advanced Computing Environment (ACE) consortium promised last week that 10 more vendors will soon sign up for the consortium's version of a future computing culture. ACE members revealed more details of the group's product plans and strategy.

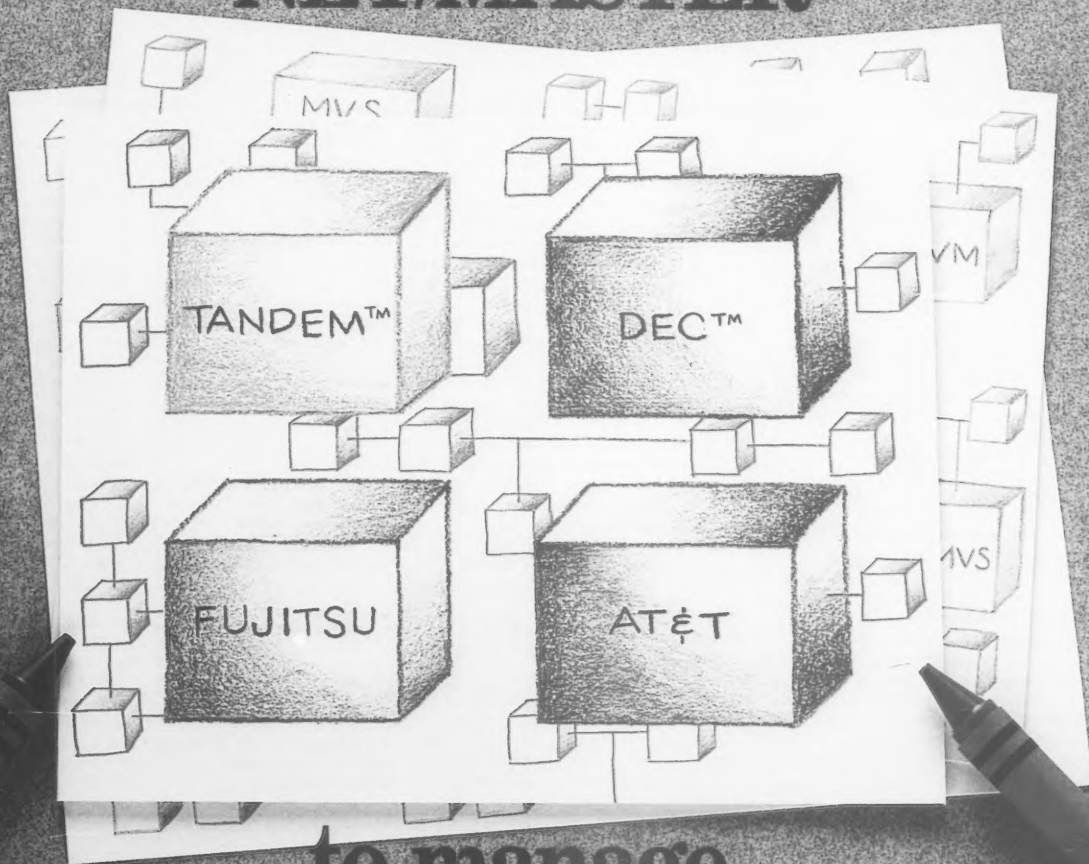
"There will be 10 more companies, with the highest interest coming from PC companies,"

said Jim Billmaier, vice president of software marketing at Mips Computer Systems, Inc.

The consortium, headed by Digital Equipment Corp., Compaq Computer Corp. and Mips, is composed of a group of 21 companies that have each committed to standards for high-end personal computers and workstations.

ACE will provide at least four versions of an ACE operating system, according to Gary Stimac, senior vice president of systems engineering at Compaq.

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## NEWS SHORTS

**Electronic medical records pushed**

The National Academy of Science's Institute of Medicine, based in Washington, D.C., published a major study last week that urged the health care industry to convert the traditional medical chart to a computer-based patient record. The study revealed that computerized records would provide numerous advantages over paper records — which are often inaccurate, illegible or missing — but the conversion will require privacy safeguards, data-exchange standards, a common data dictionary and some way for doctors, nurses and other hospital personnel to enter the data easily.

**IBM licenses HP package**

IBM has licensed Hewlett-Packard Co.'s Softbench and Encapsulator software for the technical software development market. IBM will reportedly port these over to its AIX operating system and integrate various third-party packages to work within the framework. Although no time frame was given as to when this will happen, an IBM marketing manager said it will be soon.

**Supra ported to Unix platforms**

One week after bringing its SQL-based Supra relational database to IBM's RISC System/6000 under the AIX version of Unix, Cincom Systems, Inc. announced last week the availability of Supra for The Santa Cruz Operation's (SCO) Unix. The Cincinnati-based software firm, which also has versions of Supra for Sequent Computer Systems, Inc.'s and Sun Microsystems, Inc.'s Unix, as well as OS/2, MS-DOS and IBM and Digital Equipment Corp. proprietary operating systems, said the SCO Unix version ranges in price from \$1,500 to \$100,000, depending on system configuration and modules.

**Mazzola promoted**

McDonnell Douglas Systems Integration Co. has a new leader: John Mazzola, 47, formerly vice president and general manager of the manufacturing and engineering division, was appointed president of the St. Louis systems integration subsidiary last week. He replaced departing President Mark Kuhlmann, who was named vice president/general counsel at McDonnell Douglas Corp. in March. In 1990, the systems integration subsidiary had revenue of \$271 million.

**Threadz, Metz in merger**

Threadz Software Design Group, Inc. does File F/X utilities; Metz Software does shareware. They both do Microsoft Corp.'s Windows, and as of last week, they are doing it as a single company. The merger of the two Redmond, Wash.-based utilities vendors takes their 5-month-old strategic alliance one step further. The new firm hopes to wed the shareware provider's service agility to the technical support and marketing depth of a retail operation, Metz President Art Metz said. The company will keep the Metz Software name and will feature former Threadz President Ralph Brenner as principal in charge of business development and Metz as principal in charge of technical development. All product lines will be retained and supported, according to the companies.

**Peer-to-peer product offering**

Spectrum Concepts, Inc. and Network Software Associates, Inc. (NSA) have teamed up to integrate Spectrum's IBM LU6.2 file-transfer software with NSA's packet-switching controller. The resulting product, a combination of NSA's AdaptX25 and Spectrum's Xcom6.2, is said to allow the IBM Personal Computer AT, Personal System/2 and compatibles to exchange files with other IBM systems over a CCITT X.25 network, using IBM's peer-to-peer protocol. One main target for the product, the vendors said, is Europe, where a number of companies are interested in using the popular X.25-based value-added networks to link their IBM systems to multivendor, multinational installations.

More news shorts on page 108

**Information Builders adds 1-2-3 link**

BY JEAN S. BOZMAN  
CW STAFF

ANAHEIM, Calif. — Information Builders, Inc. is betting more heavily than ever on personal computers as users ride the downsizing wave, moving applications development to the desktop and leaving production databases on larger machines.

Last week, Information Builders told users at the Fuse '91 conference here that it would provide a link between Lotus Development Corp.'s 1-2-3 Datalens and mainframes running Information Builder's Focus application development software and Focnet communications software. Pricing has not been set for the Datalens feature, which is scheduled to ship during the third quarter.

"In the past, Lotus users had to extract mainframe data and then import it into their 1-2-3 spreadsheet," said Jim Burnham, product line manager for networked applications at Lotus. He said the new method prompts the user to select desired mainframe data, thus reducing the number of steps the user must go through.

Information Builders, which is promoting its PC/Focus appli-

cation environment for client/server applications, is writing drivers for the Datalens facility. PC/Focus applications can already access IBM mainframe data stored in IBM's DB2, IMS and VSAM database structures.

Through the firm's Focnet connectivity software, PC users can also tap into data stored on Digital Equipment Corp. VAX machines and Hewlett-Packard Co. computers, among others.

**Strategy questioned**

Some industry analysts questioned the way in which Information Builders' client/server strategy is unfolding. "[Information Builders] has a lot of work to do before they turn their product into a true client/server product," said David McGovern, president of Alternative Technologies in Santa Cruz, Calif. "The application front-end piece is not designed specifically to work with relational databases, and the transaction interface is weak in that it does not guarantee the integrity of the RDBMS."

McGovern gave Information Builders high marks for its PC-to-mainframe connectivity and large user base.

At last week's meeting, Infor-

mation Builders also showed a not-yet-available product for the Apple Computer, Inc. Macintosh. Called Macfocus, the product combines the Macintosh's graphically oriented screen icons and windows with the underlying Focus applications development code. Originally due to be introduced by the time of this year's Fuse conference, it is not expected to be available for several more months.

Users praised Information Builders' willingness to address a long list of user requests from previous Fuse meetings. "We're trying to provide [Information Builders] with more feedback on their products, even while the products are being developed," said Larry J. Braun, outgoing president of the national Fuse board.

Information Builders made more than a dozen connectivity announcements. Among them were support for DEC's Digital Pathworks local-area network software, support for a variety of industry-standard graphical user interfaces — including the Open Software Foundation's Motif and Sun Microsystems, Inc.'s Open Look — and support for DEC's Mumps development language.

**'Simplified' federal overtime law causes more confusion**

BY MITCH BETTS  
CW STAFF

WASHINGTON, D.C. — When the U.S. Department of Labor issued regulations on overtime pay for computer-related occupations, it tried to clarify what it thought was a confusing law. Last week, the computer industry said the law was clear, but the Labor Department was confused.

At issue is a two-sentence statute intended to eliminate the federal requirement that employers pay 150% in overtime wages to thousands of computer programmers, systems analysts and similarly skilled workers [CW, Nov. 5, 1990].

The Labor Department and supporters of the legislation — Adapso and the National Association of Computer Consultant Businesses (NACCB) — agreed that the exemption applies to programmers paid hourly and making more than 6.5 times the minimum wage, or \$27.63 per hour.

However, Adapso and the NACCB said the Labor Department's interim regulation, which implements the law, left out other key provisions intended by Congress. They argued in written comments filed last week

that Congress meant to exempt salaried programmers, too, no matter what they earn.

The agency's interpretation seems to exempt salaried work-

wages for their long hours.

The free-lance programmers and engineers, variously described as job shoppers, contractor/consultants and migrant technical workers, said time-and-a-half pay for overtime work is needed to compensate them for the lack of health insurance, sick leave, fringe benefits and job security, as well as the travel and

**Crystal clear?**

Excerpts from the 1990 law on overtime pay for computer-related occupations:

"... the Secretary of Labor shall promulgate regulations that permit computer systems analysts, computer programmers, software engineers and other similarly skilled professional workers ... to qualify as exempt executive, administrative or professional employees ... if such employees are paid on an hourly basis, they shall be exempt only if their hourly rate of pay is at least 6.5 times greater than the applicable minimum wage rate ..."

Source: Public Law 101-583

CW Chart: Doreen St. John

ers only if their pay exceeds the level of \$27.63 per hour. The Labor Department will review the industry comments and then determine whether to revise its regulation [CW, March 11].

The premise of the 1990 legislation is that 150% overtime pay for computer programmers making \$40 per hour is too expensive, and these professionals do not need federal protection.

However, several free-lance computer contractors said they were outraged that Congress had stripped them of premium

hotel bills resulting from their transient work.

"The law has the potential to cost me \$25,000 a year," wrote Michael L. Boling, a computer contractor in Madison, Ala. He said independent contractors work "incredible amounts of overtime" because they are usually called in when projects are way behind schedule.

By charging \$35 to \$40 per hour with time-and-a-half rates for overtime, computer contractors can "reach the elusive \$100,000," Boling said.



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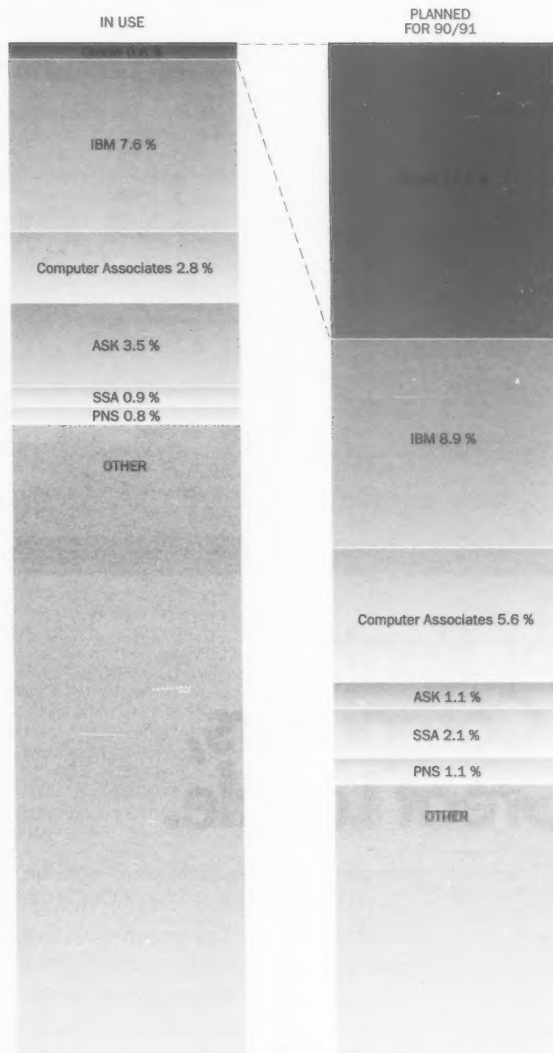
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## Electronic imaging sizzles at AIIM conference

Technology could inspire a \$4.5 billion hardware market by 1992, analysts say

BY ELLIS BOOKER  
CW STAFF

WASHINGTON, D.C. — Judging by the crowds at the Washington Convention Center last week, electronic document imaging is here, and it is hot.

More than 32,000 attendees came to the Association for Information and Image Management (AIIM) conference and exhibition. According to analysts, the real difference this year, compared with last year, was not the 23% increase in the number of visitors but their attitude to-

ward imaging technology.

"Consultants are no longer going to AIIM to look at products," said Thornton May, director of imaging research at Nolan Norton Research Institute in Lexington, Mass. "They're arriving with clients to ask questions and buy equipment."

Nolan Norton Research estimated there will be a \$4.5 billion worldwide annual hardware market supporting imaging applications by 1992.

Products using Microsoft Corp.'s Windows 3.0 as an interface for imaging applications were almost everywhere at AIIM,

and where they were not, they soon will be, developers said.

"The mistake we made was not [offering] a Windows client earlier on," said James Storm, president and chief executive officer of Toronto-based Imara Research Corp., whose product allows users to store and retrieve imaging information over a network. The developer announced at AIIM a second version of its OS/2-based imaging software that will support Windows. The new Imara version will support OS/2 at the server and Windows at the client. The Windows product

is expected to ship in August.

A number of other developers privately said that market forces were compelling them to bring forth Windows and, in some cases, to postpone work on OS/2 implementations. At the same time, several developers said OS/2 enhancements, particularly the 32-bit format, are powerful features for imaging tasks.

Meanwhile, IBM staunchly defended its commitment to OS/2 at the desktop level — although it implied that the product will be able to run Windows from within OS/2 to satisfy customer demands.

Multimedia often requires multitasking, and OS/2 Extended Edition "is a terrific base" for that, said Mark Morin, vice president of IBM Image Solutions.

More broadly, Morin sketched IBM's hopes for the market. "Within IBM," he said, "[imaging] is viewed as the No. 2 opportunity for the company." However, he declined to say what IBM's No. 1 opportunity is.

Morin maintained that IBM was "on track" with its imaging product line. To date, IBM claims, it has 300 Imageplus customers worldwide, the majority of which have Application System/400 implementations.

Despite the hoopla and jockeying for position among vendors, current and potential users of imaging technology continued to deal with real-world issues.

"If I was all paper, I'd go to imaging today," said William Swarens, director of the records branch for the U.S. Marine Corps in Quantico, Va.

However, Swarens, who manages 3.9 million personnel records, has used paper and microfiche since 1979, and he complained that not enough attention was given to microfiche-to-digital conversion issues.

### Coming of age

However, representative of many who felt imaging was just about mature enough to meet their requirements was Geoffrey A. Best, an information systems specialist at Bell Atlantic Network Services, Inc. in Freehold, N.J.

Bell Atlantic currently has a bid out. Best wants to link scanned images of terrain maps, now in paper form, to an existing computer-aided design program used by some 2,000 engineers across the telephone company's seven-state territory.

It was potential customers such as Bell Atlantic that lured Apple Computer, Inc. to AIIM for the first time. The company had no new products to announce but rather sought visibility for its claim that its Macintosh is the most cost-effective way to bring images to the desktop.

"We believe the trajectory of this industry is headed in our direction," said Ed Forman, manager of IS solutions at Apple's large-business market group. He added that since their introduction in 1984, "all Macs have had the inherent capability to show images."

Elsewhere, Sun Microsystems, Inc. executives were busy arguing about how their Unix workstations are the natural fit for the desktop.

Sun brought price comparisons showing that a fully loaded personal computer — outfitted with extra memory and special video boards and monitors — can be as expensive but offer less expandability than a Sparcstation.

Sun claims imaging accounted for 5%, or about \$140 million, of its revenue last year and that this market segment is growing at 40% per year for the firm.



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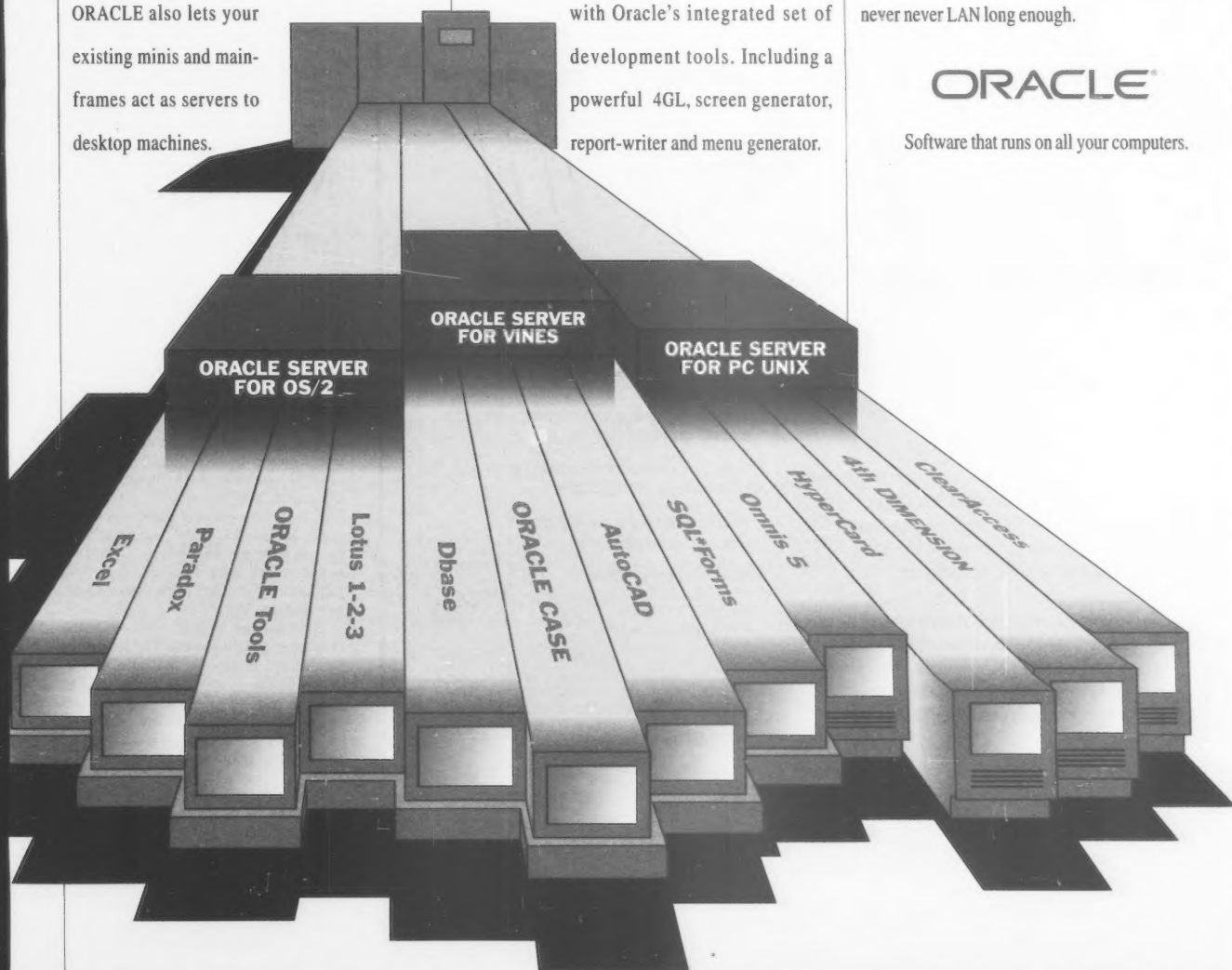
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## PC Tools polishes image

BY CHRISTOPHER LINDQUIST  
CW STAFF

BEAVERTON, Ore. — Central Point Software, Inc. plans to deliver a major upgrade to its popular PC Tools personal computer utilities software package this month.

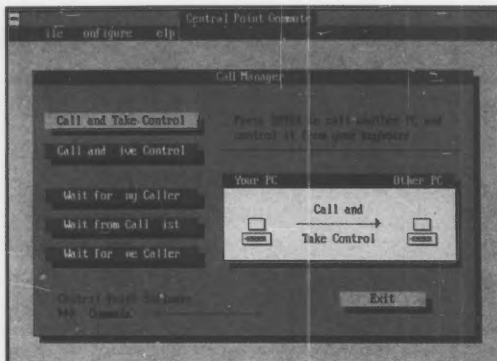
PC Tools Version 7.0, to be announced today, features more than 100 enhancements, including three applications designed for use with Microsoft Corp.'s Windows 3.0.

The Windows applications are Windows Backup, a disk backup program that

can run while other applications are being used; Windows Undelete, for file recovery; and Windows Launcher, which allows users to start applications from the Windows 3.0 system menu.

The upgrade will reportedly allow access to all available PC Tools utilities from a main menu. This addresses complaints from some users, who charged that previous versions of PC Tools were poorly integrated, which made utility access somewhat daunting, according to Central Point Chief Executive Officer Michael Brown.

The look of the user interface has also been improved and is very Windows-like,



PC Tools Version 7.0 includes remote operation function

including icons and an arrow-shaped mouse pointer, Brown said.

Version 7.0 modifies the standard PC character set — a technique known as "mapping" — in order to enhance the appearance of user screens while maintaining the inherent speed advantages of

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\*David W. DeLong, co-author of "Executive Support Systems: The Emergence of Top Management Computer Use."  
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text-based programs.

In addition, PC Tools 7.0 includes enhanced support for Novell, Inc.'s Netware with, for example, the addition of utilities that help undelete and locate files on network disk drives.

All applications are compatible with Windows 3.0 except for the disk defragmentation utility, which must be run from DOS. The installation program has also been enhanced to allow users to install only those pieces of PC Tools they intend to use, thereby saving disk space.

The package will reportedly be priced at \$179. Registered users of all prior versions of PC Tools will be able to upgrade to Version 7.0 for \$49 through July 31. Users of competing packages — products whose features overlap with those found in PC Tools 7.0 — will be able to purchase the package for \$59 through Aug. 31.

## TCP/IP support for Decserver 300

BY ELISABETH HORWITT  
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. added a few more nuts and bolts to its enterprisewide internetworking strategy last week.

DEC delivered on a statement of intent made in December 1990 to add Transmission Control Protocol/Internet Protocol (TCP/IP) support to its Decserver 300. Decserver 300 Version 2.0 software allows personal computer and terminal users to access DEC hosts concurrently via the proprietary Local-Area Transport protocol, DEC said. Non-DEC hosts can gain access via the TCP/IP terminal-to-host protocol, Telnet.

Also announced last week was the Decrouter 150, a low-end Decnet router that is said to provide the same performance as the existing Decrouter 100 at about 60% of the price. Decrouter 150 is also reportedly one of the first routers on the market to support an asynchronous and synchronous connection simultaneously.

DEC also enhanced its Decnet/Systems Network Architecture (SNA) Data Transfer Facility (DTF), which supports file transfer between IBM's SNA host environment and a variety of Decnet systems, including DEC VMS, Ultrix and RSX hosts and Microsoft Corp. DOS workstations.

DTF Version 3.0 is scheduled for release in June.

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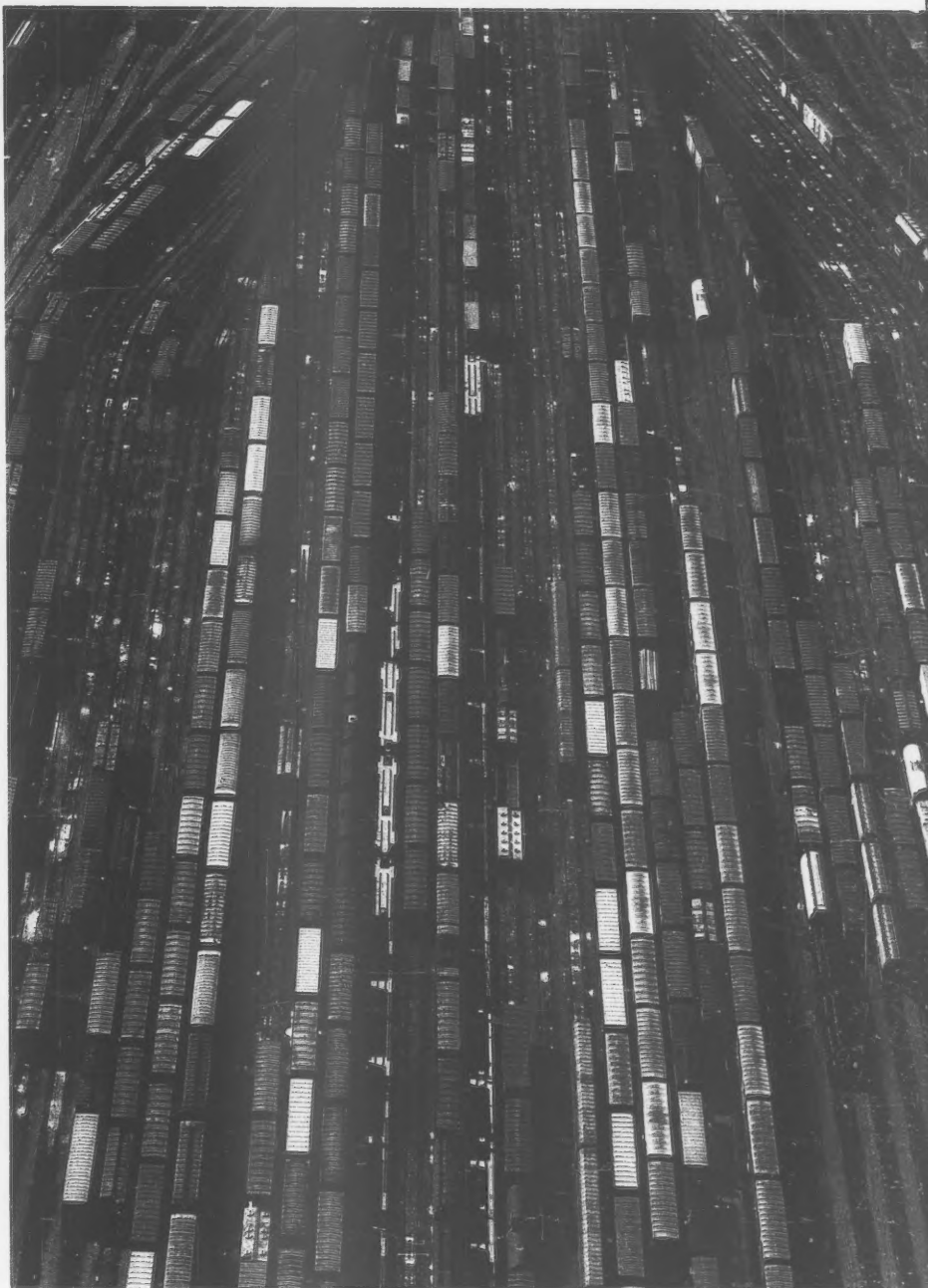
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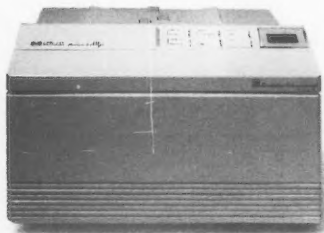
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## DG profits

CONTINUED FROM PAGE 1

Milton Jr., deputy manager at Brown Brothers Harriman & Co., a New York-based financial consulting firm, said there is a "tighter focus on what Data General does well; specifically, a very narrow focus toward the Avion server line and proprietary MV technology."

While Milton credited Skates with bringing an element of financial discipline to the company, he cautioned that it is going to be a rough road ahead as competition in the workstation and server market intensifies.

Skates came to DG four years ago as senior vice president of finance and ad-

ministration. Under his direction, the company slimmed down from 15,685 employees in fiscal 1987 to its current 8,500.

Several projects have also been abandoned, most notably DG's foray into the telecommunications field — a much publicized venture with the Nippon Telegraph and Telephone Corp., code-named Asparagus.

"When Ron [Skates] arrived here, we had gone through a lot of hard times, and we weren't making any



West said he and Skates had to adjust to each other

money," West recalled. "There was no clear light at the end of the tunnel, and we definitely had a need for law and order."

West acknowledged that it was difficult to see pet projects, including a fault-tolerant line and a desktop strategy, "go by the boards."

"Initially, we didn't understand each other well," he said of his relationship with Skates. Noting that they had to overcome stereotypes of "bean counters and arrogant engineers," West said it was painful

to find and establish a dialogue.

"Data General is a technologically superior company that was going in 27 different directions," Skates said in a recent interview. "One and a half years ago, we sat down with an entire management team to decide on a strategy and determine which products fit into that strategy."

The result was a focus on the reduced instruction set computing-based Avion as a server in several strategic vertical markets, coupled with maintenance and upgrades for the company's mainstay MV minicomputer customers.

"Looking at the DG cost structure, what I find a little ominous is the drop in research and development expenditures," said William W. Sines, director of midrange systems and server research at Technology Investment Strategies Corp., a Framingham, Mass.-based market research and consulting firm.

### Less R&D funding

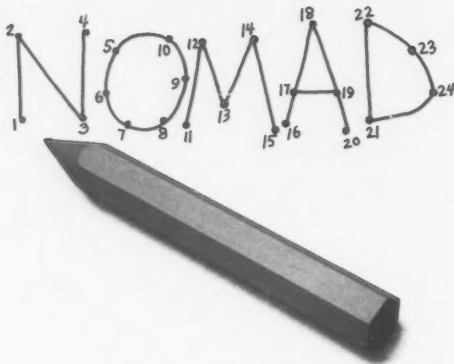
According to Sines, monies for research and development have decreased from \$35.7 million in March 1990 to \$26.1 million in March 1991. "We must watch DG closely in the next 12 to 18 months to make sure the cuts have not affected the core business," Sines said.

One core business customer, Gary Nesmith, data processing manager at Pilowtix, Inc. in Dallas, said the company "never seemed down from a performance, support and delivery standpoint."

"First-class technology has kept DG alive," Skates said. "It's my job to surround myself with people smarter than I am and provide them with the right incentives. We have a first-class team of responsible people working on our goals. My job is to make sure it happens."

West summed up his relationship with Skates: "Both of us realize that we work better together than we do against each other. We have forged a relationship of trust — the kind that usually happens after going through hell together."

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## Sterling regroups software teams

WOODLAND HILLS, Calif. — Sterling Software, Inc.'s Answer Systems Division has realigned its product inventory and repositioned its marketing strategy, combining three software development teams and seeking new business relationships to fill in the gaps in its line.

Collectively, these changes are being called the Corporate Applications Management Initiative. Executives will describe details of the plan, initially outlined at a recent user conference in New Orleans, to industry analysts and journalists during the next two weeks.

"We have mapped our products against IBM's AD/Cycle so that users can map their strategy against our product offerings," said David Weir, president of the Answer Systems Division. "We are trying to address enterprise computing, meaning that we will support Unix and open systems in addition to our traditional IBM-compatible products."

John George, director of the firm's AD Labs Division in Ottawa, said Sterling will rely heavily on its Zim fourth-generation language to generate code for OS/2, MS-DOS and Unix environments.





# Announcing a Cure for the Terminal Blues

Now they're calling it a *non-programmable* terminal. Which might make you think technology has simply passed it by.

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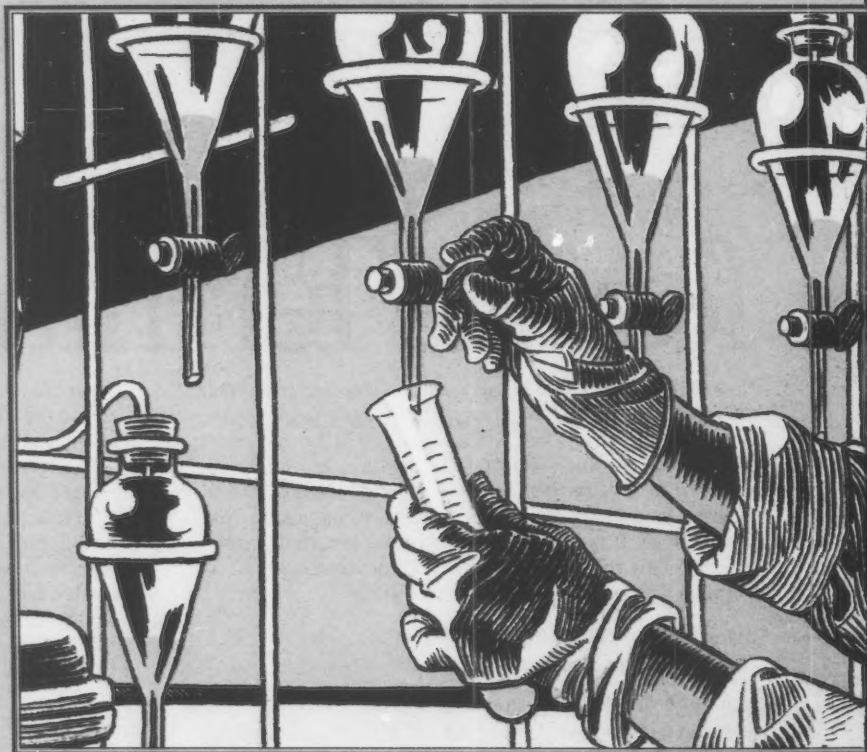
It was a task no less formidable than developing a new drug and bringing it to market. We had to be creative. Persistent. Utterly dedicated to our goal.

That goal was to bring truly open computing to pharmaceutical companies. By using our Network Application Support (NAS) Environment for Manufacturing to integrate departments as diverse as R&D, Quality Control and Production. So people can work together to develop new products, get them approved and into the market in less time than ever before.

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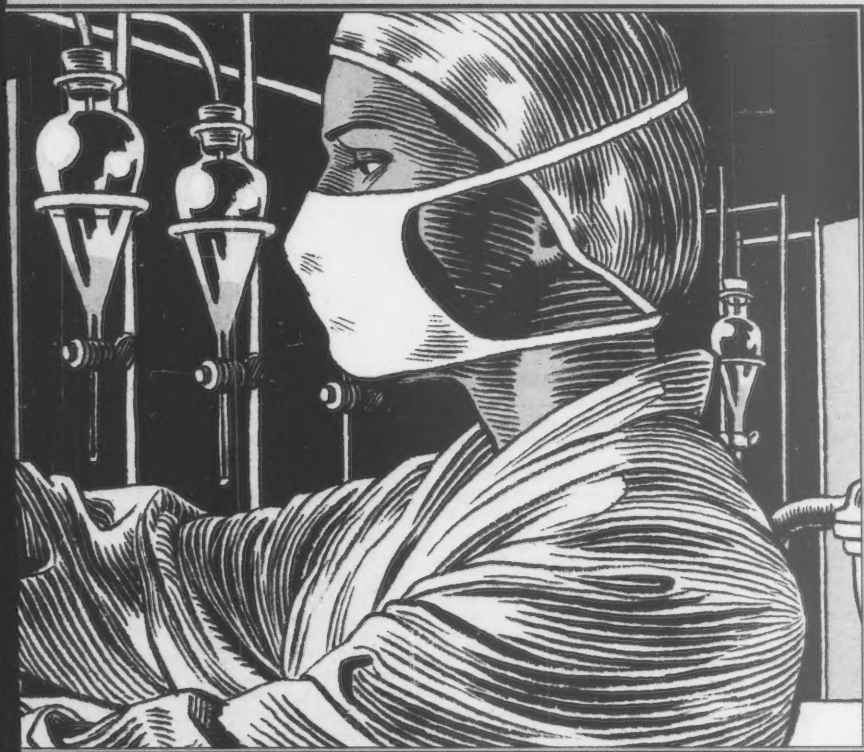
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## ADVANCED TECHNOLOGY

## TECH TALK

## Of microns and microchips

■ AT&T Microelectronics and NEC Corp. recently said they plan to collaborate on a manufacturing process that quadruples the amount of information and functionality that today's most advanced microchips can hold. The companies said they will develop a manufacturing technique called the .35-micron process that will let them etch lines only .35 microns wide into a chip. The chip could be used to create disk drives with all of the electronics on a single chip, handheld digital telephones and economical signal processing gear for advanced television technology, the companies said. The process is slated to be introduced in mid-1995.

## A set of standards

■ The Institute of Electrical and Electronics Engineers, Inc. (IEEE) and Information Handling Services (IHS) have published IEEE standards for computers and electronics, instruments/terminology, communications, applications and power on compact discs. The four-disc set contains the full text of IEEE standards and is illustrated with charts and graphics. The disc set will be offered as a service and updated every 60 days, IEEE said. The service includes IHS' worldwide standards index.

## Hard and hardy circuitry

■ Researchers at North Carolina State University at Raleigh and Oak Ridge National Laboratory in Oak Ridge, Tenn., have devised a method of forming single-crystal synthetic diamonds on a base of copper. The single diamonds were about .39-in. square and only 500 angstroms thick. An angstrom is about four billionths of an inch. The finding could lead to the development of diamond film transistors that would be packed more densely than silicon and run cooler. The diamond film chips could be used in areas where heat does not allow the use of silicon circuitry.

## Visualizing cleared-off desktops

Scientists make on-screen desktop space larger with 3-D rooms and cone structures

BY MICHAEL ALEXANDER  
CW STAFF

Today's popular user interfaces are metaphors for office desktops, file cabinets and other items used to store information. That worries some computer scientists because more users want to store information on their on-screen desktops but are finding them as crowded as the tops of their desks.

"Information retrieval is almost always part of some larger process of information use," said Stuart Card, a computer scientist at Xerox Palo Alto Research Center (PARC) in Palo Alto, Calif. "What is really needed from the point of view of the user isn't so much information retrieval itself but rather the amplification of information-based work processes."

Card and fellow Xerox PARC computer scientists Jock Mackinlay and George Robertson have spent three years developing an "information visualizer," an experimental user interface for information retrieval.

There is an abstract cost associated with retrieving information based on the effort or resources required to find and access it. For example, the cost of retrieving information stored in a desk is low, but the cost of retrieving it from a library is high. The scientists are developing a user interface they said they believe will help lower the cost of retrieving information.

"We're interested in methods and machines that would allow people to bring to a task more information more quickly than otherwise possible," Card said.

The computer screen as a metaphor for the desktop and other office storage devices is undergoing reevaluation because the cost of retrieving information escalates as more elements are added. Put too many items on a desktop and it becomes difficult to identify objects and the information they represent.

Computer screens are so small it is impossible to dedicate the space needed for icons all of the time, Card said. "Our technique effectively makes the screen space larger than it was."

One solution is to make the display, but that has economic and technical drawbacks. Another is to increase the

number of desktops and enable the user to move from one to another with navigational aids.

The Xerox researchers have taken that notion one step further with their development of an information work space that consists of a collection of interconnected three-dimensional

in computer-generated simulations. However, users need not don special gloves or goggles, Robertson said.

The information work space uses information visualization techniques the scientists have dubbed "cone tree," used to visualize hierarchical information, and "perspective wall," used to visualize linear information.

In a simple cone tree, a single, large cone with nodes or index cards arrayed around its rim is suspended by its point from the ceiling of a room. From the cards attached to the rim of the cone are suspended several smaller cones, each with its own set of cards. The cones are shaded but transparent enough that they do not block the view of the cones behind them.

When a card is selected with the mouse, the cone tree rotates so that the selected card and each card in the path from the selected card up to the top are brought to the front and highlighted.

The hierarchy is presented in 3-D to make the most use of the available screen space and to enable visualization of the entire structure, Robertson said.

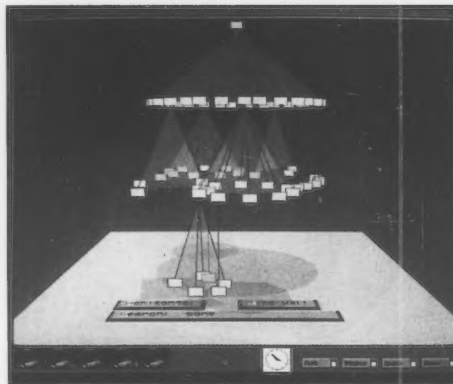
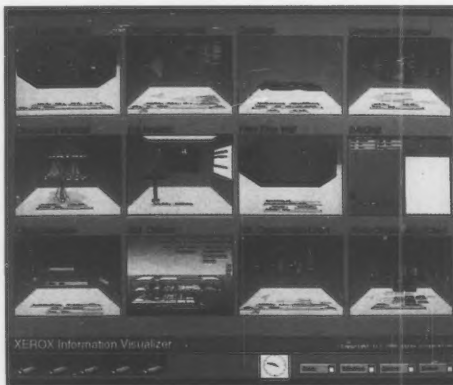
To demonstrate the cone tree's usefulness, the scientists packed an entire Unix directory, with about 600 directories and 10,000 files, onto a computer screen. "This is the first time that anyone has really seen what a Unix directory really looks like," Robertson said.

Rotating the tree lets the user look at relationships between cones.

The perspective wall is used to display information that is arranged alphabetically, chronologically or in some other linear structure, Mackinlay said. The information is displayed on a 3-D wall divided into three sections. The center panel is used for viewing details and the two adjacent panels are for viewing context. The vertical dimension of the wall can be used to visualize layering in an information space.

The scientists said they are exploring the prospect of commercializing their information visualizer interface with a number of unnamed vendors.

"While the industry is squabbling about a particular desktop look and feel, the hardware technology is moving out from beneath that," Card said. "There are a wealth of possibilities" for new interfaces, he added.



Xerox PARC scientists have developed a user interface for information retrieval, using a collection of interconnected 3-D rooms (top) or the cone tree to visualize information

rooms. Underlying the interface is a cognitive coprocessor — an architecture for animation to make it even easier to spot relationships and detect changes in the interface. Using both 3-D perspective and interactive animation makes it possible to pack the space more densely with information than would otherwise be possible, Card added. "The rooms are presented in 3-D to make the most use of the available space and to enable the user to see the entire structure," he explained. "Animation shifts some of the cognitive load to the perceptual system."

The user moves from room to room by "walking," selecting the desired room from a pull-down menu or pointing with a mouse to a room on a two-dimensional layout of the work space.

The idea is similar to artificial reality, in which users immerse themselves



**The experts say companies  
like yours will spend \$240 billion on  
client-server computing.**



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It is not a fad. Or a buzzword. Or somebody's vision of the future.

Client-server computing is real.

It's the fastest growing form of business computing since the PC.\* And its rewards are tempting: Tremendous power for the dollar. Longer hardware lifecycles. Lower training costs. Less maintenance. Faster time-to-market. Better workgroup productivity.

Some companies are even using it to earn profits in areas of their business that once drained revenues.

That's the bright side.

There is also a dark side. Like other technologies that have come before it, client-server computing is surrounded by confusion and hype. Every major computer company has jumped on the client-server bandwagon, each with its own promises — and products — to sell you.

Since Sun® was the first systems vendor to devote itself completely to client-server computing, it's fitting that we also should be the first to make sense of it all for you.

Here goes.

## *The fourth wave.*

Those who do not learn from history are doomed to repeat it. So what has been learned from the past half-century of technology?

In the 1950s and 60s, businesses saw how mainframes could turn centralized data into a competitive edge.

In the 1970s, companies learned to save money and boost performance by distributing data among smaller, faster minicomputers.

In the 1980s — the PC decade — we all discovered how profitable computers could be in the hands of managers, clerks, engineers, and just about anyone else who sits behind a desk.

Now, we are in the midst of a "fourth wave:" Client-server computing.

Ideally, it combines a PC's ease of use with the computing power of far larger systems. It lets people locate information on computers throughout the company — without having to

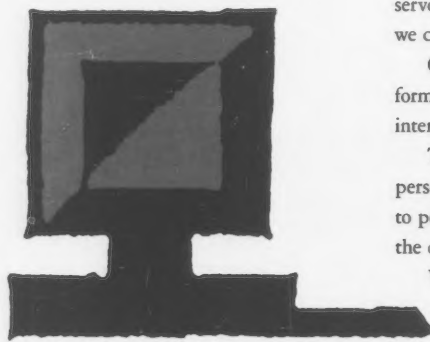
know where to look, or how to get there. And it inspires workgroups to collaborate in entirely new ways.

These ideals are not just Sun's. They're shared by every vendor of client-server computing.

What makes Sun different is how we accomplish them:

1) We put the focus of computing power wherever it can do you the most good — on the desktop, on the server, or split between the two.

2) We build everything into our systems that's needed for true client-server computing (RISC processing, multitasking, Ethernet,



e-mail, audio, a graphical user interface, and plenty of memory and storage).

3) We give you a simple, consistent way to work within applications, access files, print, send mail, and manage network resources.

4) We offload processing from host computers to servers and workstations — your system can grow without limits, and in less costly increments.

5) We integrate all of your company's computers, so you can draw upon the data, applications, and processing power of every computing resource on the network.

That's what we do.

Now here's how we did it.

## *The luxury of nothing.*

Nine years ago, when Sun began to explore client-server computing, we had a huge advan-

tage over other computer companies.

We had nothing to lose.

No expensive hardware to sell. No proprietary networks to defend. No aging operating systems to keep alive.

It was the rarest of opportunities: Our engineers could literally start from scratch to design a total client-server environment. An environment that would, over time, embrace promising new concepts in computing, such as RISC processing, object management, digital imaging, and multimedia, to name a few.

We were free to pick and choose only those technologies that made the most sense for client-server computing. And when we did choose, we chose only one:

One operating system. One hardware platform. One networking system. One graphical interface.

That way, Sun was able to commit every person, every dollar, and every minute we had to perfecting a single, integrated approach to the client-server environment.

Which leads us to another advantage Sun had in its favor:

By starting out with a completely open mind, we ended up with completely open technology.

## *Open to anything.*

From the beginning, we were determined that a Sun client-server system should be able to include the hardware, networks, and databases you already use.

Today, every Sun workstation and server is powered by the SPARC® microprocessor, running the UNIX® operating system, accessible by the OPEN LOOK® graphical user interface, and linked together in the ONC™ networking environment.

Each of these technologies was designed on open industry standards; or, where no existing standards were to be found, we made ours available to the rest of the computing world.

Take UNIX, for instance. It's the world's

\*Independent analyst Alex. Brown & Sons estimate that commercial and technical businesses worldwide will invest \$240 billion or more this decade in the desktop computers and servers that comprise client-server technology.

foremost multivendor, multitasking operating system. Every major computer company now offers it. Ten million people use it. And thousands of software developers write for it.

Our SPARC hardware platform is anything but proprietary. More than 25 vendors are now at work on SPARC laptops, desktops, servers, minicomputers, mainframes, even supercomputers. All running the same, compatible software.

OPEN LOOK brings a consistent user interface to all kinds of software, across all kinds of systems. With it, applications can actually look and act the same way on Sun, IBM, Digital, H-P, DOS, and Macintosh computers.

And as for networking, there are ONC products for all popular operating systems — UNIX, Ultrix, AIX, Xenix, DOS, OS/2, VMS, MVS, VM, and Macintosh — as well as for the PC networks made by Novell, 3Com, and Banyan.

Still, we weren't satisfied just to make our systems compatible with your equipment.

Making them compatible with your people — that was the real trick.

*What you don't see is what you get.*

Long ago, we asked ourselves:

Could people exploit the full power of UNIX, without seeing strange messages like *mount: /dev/fd,0a on/mnt: Invalid argument?*

Could a systems administrator manage an integrated, multivendor network without seeing its underlying complexities?

Could a software developer design around a graphical user interface, without seeing a line of its code?

The answers are yes, yes, and yes.

We've made client-server computing simpler for users by giving them a graphical interface that's as intuitive as Macintosh or Windows 3.0. Nearly 2,500 software applications run on Sun systems — a growing number of which are now committed to the OPEN LOOK environment — including Lotus® 1-2-3®, WordPerfect®, and others you may already be using.

We've made system administration simpler with SunNet™ Manager. It's a powerful set of tools that actually uses the network to manage itself.

We've made life simpler for software developers, too. With more than 400 Sun and third-

party CASE tools. And with OpenWindows™ software, which lets designers create an OPEN LOOK interface with a few quick strokes of a mouse.

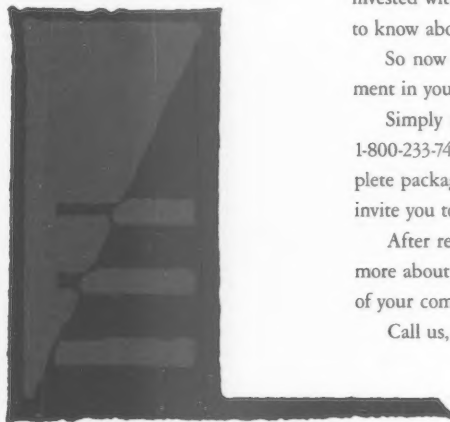
Instead of a few thousand lines of code.

*Is it really worth it?*

Moving from one style of technology to another is never an easy matter for a company. There's a lot of money involved. People get nervous about changes. Problems happen.

The question to ask yourself is: Do the rewards make it all worthwhile?

The *Wall Street Journal*, Mitsubishi Bank, New Zealand Inland Revenue, Northwest Airlines, Shell Oil, Xerox, NYNEX, and hun-



dreds of other respected corporations around the world are using Sun client-server systems today. This is what they report:

*We get more computing for the money.* Companies find that a network of Sun servers and workstations accomplishes more work in less time than the costlier host systems they had previously used.

*We're cutting costs and raising profits.* For example, a Canadian insurance company's Sun system reduced overhead expenses by 55 percent, and boosted profits by 30 percent.

*We not only protected our investment, we improved it.* Existing host systems and PCs can be put to more efficient use as network servers and clients. Offload some of a mainframe's tasks to other servers, and you could even prolong its life expectancy.

*We have more reliability than ever.* If one computer on the network experiences a prob-

lem, its workload can easily be moved to another machine.

*We're no vendor's prisoner.* The open technologies of SPARC, UNIX, OPEN LOOK, and ONC give companies the freedom to choose among vendors for the price and performance that suit their needs.

*We save a fortune on upkeep.* Sun servers cost far less to keep running than a typical mainframe or minicomputer. By replacing their old timesharing system, companies could save enough on just one year's maintenance to pay the entire cost of their Sun client-server system.

*The next investment is ours.*

As much as we appreciate the time you've just invested with us, the fact is there's much more to know about client-server computing.

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## EDITORIAL

## European bailout

**A**FTER HAVING POURED billions of dollars into a sinkhole to support inefficiency, European governments seem at long last to have realized there's one thing money can't buy: the health of Europe's ailing computer makers.

In a fiercely competitive world market where a vendor's success is directly related to how nimble it can be, Europe's computer companies have been narcoleptic by comparison.

There are two reasons for this sad state. First, several big vendors got direct injections from the public trough to compensate for huge losses run up by inefficient and poorly run operations. The French government, for example, has diverted huge sums to Bull for almost 10 years. The result? Last month, Bull reported an annual loss of \$1.2 billion.

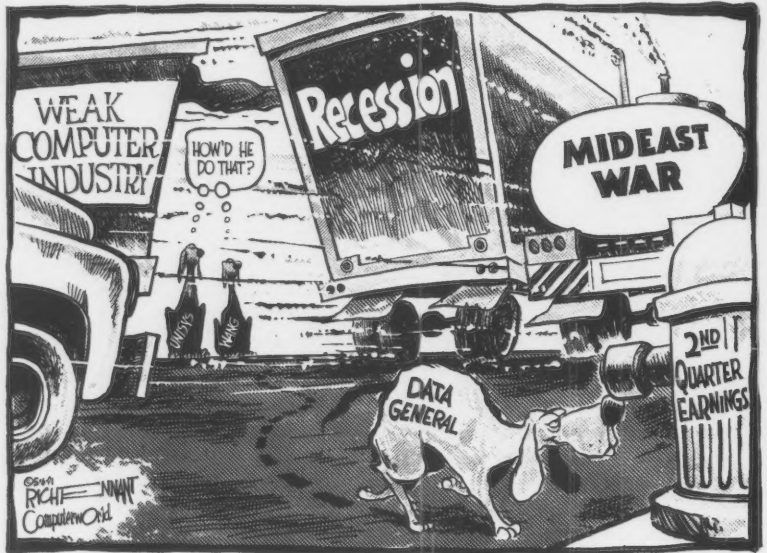
The second governmental prop has come in the form of government computer contracts, which have bestowed great favor on the local producers. So while Siemens, for example, has not benefited from the blatant governmental largesse that has propped up Bull, roughly one-third of its domestic computer sales go to the German government, according to *The Economist*. By comparison, no major U.S. or Japanese computer maker has government sales even close to that figure.

In addition to losing prodigious sums of money, the Europeans have been painfully slow to catch the open systems wave, electing instead to stick steadfastly to their proprietary (and ostensibly more profitable) architectures. And, as *The Economist* notes, the Europeans have forged partnerships with European governments that have promulgated various forms of protectionism, resulting, for example, in European users paying 50% or more than U.S. buyers for PCs. And after all this, the vendors are still awash in red ink.

Finally, however, the governments themselves are staring at the local computer makers and saying *no mas*. Last year, the UK cut the apron strings on ICL, allowing its majority purchase by Fujitsu. (The company was reportedly then disallowed from participating in projects sponsored by a pan-European consortium. Apparently, not all lessons have been learned.) And the French government has cleared the path for the privatization of up to 49% — just under controlling interest — of state-owned companies.

The handwriting is clear. Government bailouts will work no better for the European computer makers than they did for the British carmakers. And any mass consumer of information technology — the government, for instance — that settles for anything less than state-of-the-art equipment will only harm its own drive for greater efficiency.

The real tragedy is that this laissez-faire realization may come too late to salvage much of the indigenous European computer industry.



## LETTERS TO THE EDITOR

## Wrong idea

I want to clarify statements I made at the Information Systems Security Association's conference that appeared in Michael Alexander's April 8 article titled "Vendor security chiefs cite LAN, laptop threat."

My comment that information security was new at Hewlett-Packard Co. referred to last year's formation of a corporate information security department. This department was established to develop corporate-wide policy and provide more service to local divisions as they develop standards and practices for security.

HP has always had controls in place to safeguard our sensitive information. What is new is the more active role corporate now takes in ensuring the security of all computer systems used at HP.

Sam Miller  
Information technology  
engineer  
Hewlett-Packard Co.  
Palo Alto, Calif.

## No personal choice

Marc S. Sokol's recent viewpoint article on mainframe programmers [CW, April 15] was very interesting, but I think it was directed toward the wrong audience.

I've been a mainframe programmer and consultant for more than 13 years, and I have yet to work in a shop that gives a programmer a choice of working environment.

I'm aware of some of the tools available for use on PCs. I recently saw a demonstration of the capabilities of the Micro Focus programmer's workbench,

and I was greatly impressed. I know what a tool like that would allow me to do, but until the people I work for provide the resources, I'll continue to be a "mainframe programmer."

S. A. Bullard Jr.  
Somerville, N.J.

## Mainframe credit

Marc S. Sokol, the author of "Mainframe programmers and the V-8 mentality" [CW, April 15], appears to believe that mainframe programmers freely choose a hardware platform for applications development and that the PC platform is superior to the mainframe for development of mainframe applications. As a mainframe programmer with 25 years of experience with mainframes and minicomputers and five years with PCs, I cannot support those beliefs.

I have yet to meet a programmer who has a free choice of platforms. Personally, I have a limited choice, but generally a programmer's "choice" is dictated by the corporate platform.

What the mainframe shops need are compelling reasons to migrate to PCs; adding significant value to the existing applications development software tools might be reason enough. Simply cloning the mainframe environment onto the PC obviously is not enough.

It just seems unreasonable to categorize mainframe programmers as "V-8" chauvinists because the PC environment is not as good for mainframe applications development as the author believes, nor is it as good as it should be.

Kerry Carlin  
GE Capital  
Barrington, Ill.

## Litigious society

"I would sue everybody, jointly and severally," said David Newman Jr., an attorney and associate professor of electrical engineering and applied science at George Washington University. This is a quote from an article titled "Who is liable? Just ask the expert" [CW, April 15].

This is a major problem with society today. No one wants to take responsibility for his own mistakes. It is easier and more profitable to sue everyone else. What is alarming is that this philosophy is being advocated by our nation's educators at institutions of higher learning.

As a result, product liability insurance can account for up to 50% of the cost of goods; medical doctors are refusing new patients, and some are even quitting the profession. The experts are now telling us that the vendor of an expert system can be held liable for the misuse of a purchased system. Is this any different from Ford Motor Co. being sued because its product was used in the commission of a crime? This madness might be curtailed if the self-serving experts' judgment was not clouded by contingency fees.

Jeff V. Pulver  
Intercomp Design, Inc.  
Neshanic Station, N.J.

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# We can't let this one slip away

High-definition technology is crucial to future of U.S. manufacturing

REP. DON RITTER



We are on the verge of radically changing the way we transmit and receive visual information. When digitally

combined with computer technology and, eventually, a national fiber network, high-definition systems (HDS), including high-definition television, can change the way we all live and work.

HDS represents another benchmark in the evolution of electronic goods in the direction of digital technologies. And, like its electronic/optoelectronic predecessors — videocassette recorders, fax machines, compact discs and others — it is driving the state of the art for a number of technologies. HDS will be integrally and strategically linked to a number of high-value-added manufacturing industries — semiconductors, consumer electronics, computers and telecommunications, among others.

HDS will also be central to the changing manufacturing

base of this country. We simply cannot afford to let U.S. companies be absent from the HDS market. This would almost certainly provide our competitors with a virtually unassailable advantage in the technologies that will underpin many of tomorrow's manufacturing industries.

## Manufacturing matters

Toffler, Naisbitt and the other "postindustrial" pundits are simply wrong when they downplay manufacturing with a smokestack as the symbolic pejorative. Manufacturing's productivity growth and quality improvements are the brightest spots in our economy. Our exports are almost totally dominated by manufactured products, and manufacturing supports many of the best jobs in services. The continued renaissance in the U.S. manufacturing sector is critical if we are to remain a global economic power. We need a clear commitment by Congress and the Bush administration that "manufacturing matters," not more treatises on how we're becoming a "service economy."

We also need to recognize that some technologies and industries are more crucial to our country's future than others. When this is translated into action, it risks being tagged with the no-no labels of "industrial policy" or "picking winners and losers." In reality, however, the government picks winners and losers all the time. We wouldn't have a computer industry without U.S. Department of Defense funding for the first computers or a satellite communications industry without NASA. There are also whole government departments devoted to maintaining a viable U.S. national position on food and energy. Isn't it time to make the same commitment to our manufacturing industries?

Recent legislation has begun to establish a framework for a new technology policy. For example, the Advanced Technology Program (ATP) at the National Institute for Standards and Technology provides seed money to help U.S. businesses collaborate on precompetitive, generic technologies with high commer-

cial potential. This program is explicitly aimed at technologies such as HDS, and its budget is on the way up.

## Policy progress

ATP signals an important shift in the administration's technology policy. It enables the government to participate with the private sector in research activities on generic technologies that have the potential to contribute to a broad range of government and commercial applications. For example, because the Defense Department needs HDS for a broad range of video applications including targeting and battle management, the Defense Advanced Research Projects Agency (DARPA) has been working with the industry on several projects aimed at improving HDS and reducing its cost. Recognizing the importance of these efforts, Congress voted to appropriate \$125 million to DARPA for fiscal 1991.

During the last session of Congress, further improvement on the existing policy framework was proposed in the form of the American Technology Preeminence Act. Though not yet enacted into law, the act is being reintroduced into the current session of Congress.

The act would amend the

ATP by allowing the secretary of commerce to provide support for joint ventures to solve generic technology and manufacturing problems in emerging technologies, including HDS specifically. It also seeks to stimulate antitrust law reform to enable joint production ventures, to institute an investment tax credit for emerging technologies and to create a national commission that would study ways to reduce capital costs for HDS and other emerging technologies.

Among other provisions, the act would create a high-resolution systems board which would help coordinate the HDS activities of numerous federal agencies, monitor HDS exports from the U.S. to guard against "dumping" and promote the transfer of HDS technology into commercial products.

We must continue to take positive steps in developing a policy that ensures significant U.S. presence in HDS development, manufacturing and program distribution. World economic leadership in the 21st century depends on it.

Ritter, who is a seventh-term member of the U.S. House of Representatives (R-Pa.), chairs the Republican Task Force on Technology and Policy and is Co-chairman of the HDTV Caucus.

# Adventures in the Soviet marketplace

STEVE CRUMMEY



As the walls of communism crumble and the Soviets pledge a move toward a market economy, many view

the Soviet Union as a new frontier to be conquered. We at Lotus certainly agree with that view. An immense and untapped market, the Soviet Union holds promises of rapid and widespread growth. In the computer industry, for example, the installed base of personal computers is expected to grow from its current 400,000 to 28 million during the next 10 years.

As we and other companies attempting to operate in the Soviet Union have learned, however, there are also great risks in entering this truly foreign market. Political instabilities, pricing variations, copyright violations and cultural differences are just a few of the many challenges companies must face when attempting to enter into the Soviet marketplace.

Although the current political and economic upheaval cannot be ignored, we have found that most Soviet organizations are eager to work with Western

companies and continue their move toward a market economy. While the desire is there, however, the knowledge of such an economy is not. The Soviets have no concept of a competitive market.

Trained as order takers in a government-regulated economy, the Soviets have never had to compete on price, quality or service. Creating an advertising campaign or generating a sales lead, for example, are unknown tasks in the Soviet Union. As a result, a significant amount of time must be invested in teaching basic Western business practices.

## Structural hazards

While the move to a market economy is on, much of the old structure remains. Even in the most stable of times, the Soviet infrastructure represents a maze of state committees, republic governments and town councils. Deciding which level to approach, and how, can have significant consequences.

For example, under a tax law passed by the Soviet parliament, companies pay a corporate tax rate of 45%. A different law passed by the Russian republic parliament calls for a 38% tax. At first, the choice seems obvi-

ous. Most companies would prefer to register in Russia and pay lower taxes. However, in doing so, a company limits itself to working solely in Russia, for there is little cooperation among the other republics. In addition, a company runs the risk of offending the central authorities, who control access to banking, transportation and supplies, among other things.

Even at the most fundamental level, business is hampered by an ancient and rapidly deteriorating structure. Many of the business mechanisms taken for granted in other parts of the world barely exist in the Soviet Union.

Outside of several major cities, no mail delivery system exists. Where there is postal service, theft is rampant. The most effective means of transporting goods is hand delivery. For example, one of Lotus' dealers in Siberia — where, believe it or not, there is a significant amount of business — must fly six hours to Moscow to pick up his orders of 1-2-3. Upon returning to his territory, the dealer delivers the product to his customers.

Telecommunications consists of a 1930s German telephone system. Placing an external call from within the Soviet Union requires reserving an international

telephone line two days in advance. Even then, it is doubtful that the call will be placed, leaving a company's employees in the Soviet Union virtually incommunicado with the rest of the world.

The nonconvertibility of the Soviet ruble poses a catch-22 situation for Western vendors.



Scott Matthews

Selling for dollars ensures revenues at full value and the ability to get those revenues out of the country. However, very few Soviet buyers have access to foreign currency. Pricing in rubles also has limitations. Aside from rapidly decreasing value, the three ruble exchange rates make it difficult to place a relative ruble value on a product. At the official exchange, a \$495 software

package should be priced at approximately 15,000 rubles. This is a major chunk of cash for a Soviet organization trying to justify purchasing multiple copies from an official dealer, especially when a pirated copy sells for as little as 60 rubles.

Piracy represents both a major business barrier and a cultural barrier. Western companies are faced with the challenge of trying to sell in a market where copying software is not considered illegal. While many former Communist bloc countries have passed copyright laws, no such legislation exists in the Soviet Union. Piracy is rampant because the notion of private ownership does not exist. Soviets even take offense at the word personal, as in personal computer.

When the challenges are met, the rewards are many. We now have 45 dealers in 25 cities throughout the Soviet Union. In the first three months of Russian 1-2-3's availability, Lotus sold more than 1,000 copies of it. But an even greater reward lies in fulfilling a need and desire for products that aid the transition to a market economy.

Crummey is senior vice president of the International Business Group at Lotus Development Corp.

# The IEF™ can help you develop unprecedented quality, productivity



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Vice President  
Director, Information Systems  
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Senior Programmer/Analyst  
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"The strengths of the IEF are clear-cut. One obvious quality advantage is that application changes are made to diagrams, not code. This ensures ongoing integrity—the specification always matches the executing system."

**Paul R. Hessinger**  
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"I've seen other CASE tools fail, so I raised the bar high when we evaluated the IEF. It passed with flying colors. I could not be happier with my decision to adopt the IEF company-wide."

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"Our users were extremely pleased when we finished our first project—a 60-transaction system—in one-half the budgeted time. We had tried interfaced CASE tools without success. IEF integration makes the difference."

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"We used the IEF to rebuild our aging Frequent Flight Bonus system. With DB2 tables of up to 52 million rows, we needed high performance. And we got it...98% of our transactions complete in less than 3 seconds."

**Cloene Goldsborough**  
Director of Data Resource Management  
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"Our first IEF system was completed faster, and with fewer errors, than any system I've ever seen. If I had to go back to the old ways, I'd find another job...outside the DP world. It means that much to me."

**Mogens Sorensen**  
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Nykredit (Denmark)

# Open information systems with productivity and maintainability.

## The success of Texas Instruments CASE product is proven—in the field.

Major companies have used TI's CASE product, the Information Engineering Facility™ (IEF™), for everything from rebuilding aging high-maintenance-cost systems to development of new enterprise-wide strategic systems.

### Study shows zero code defects.

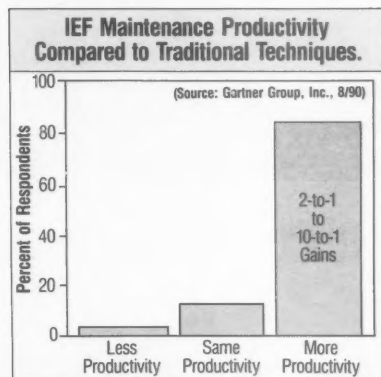
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) IEF developers reported zero defects—not one abend had occurred in IEF-generated code.

### Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, more than 80 percent had experienced gains of from 2-to-1 to 10-to-1. (See chart.)

### Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

### Mainframe applications can be developed and tested on a PC.

With our new OS/2 toolset, you can develop mainframe applications, from analysis through automatic code generation, on your PC. Then, using the IEF's TP monitor simulator and the diagram-level testing feature, you can also test these mainframe applications without ever leaving the PC.

### More environmental independence coming soon—develop on PC, generate for DEC/VMS, TANDEM, UNIX.

The IEF has generated applications for IBM mainframe environments (MVS/DB2 under TSO, IMS/DC, and CICS) since early 1988. Soon you'll be able to develop systems in OS/2 and then automatically generate for other platforms. DEC/VMS, TANDEM and UNIX are scheduled for availability in 1991. More will

follow. We are committed to increased environmental independence in support of the Open Systems concept.

### We are committed to standards.

IEF tools and IEF-generated code will comply with standards as they emerge. We will adhere to CUA standards and to the principles of IBM's AD/Cycle and DEC's COHESION—and we will support Open Systems environments centering around UNIX. In any environment, the COBOL, C and SQL we generate adhere closely to ANSI standards. Our presence on standards committees helps us keep abreast of ANSI and ISO developments affecting the CASE world.

### Full-service support.

Of course, our technical support, consultancy, training courses, satellite seminars, and other informational assistance will continue apace. We also offer re-engineering and template services. This full-service support will remain an integral part of the IEF product.

**For more information, including a VHS video demo, call 800-527-3500 or 214-575-4404.**

**Or write Texas Instruments, 6550 Chase Oaks Blvd., Plano, Texas 75023.**

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# SYSTEMS & SOFTWARE

## COMMENTARY

Jean S. Bozman

### All the same rules



The PC rebels of the 1980s had better put on their seat belts in the 1990s: They are about to hit the information management wall. As the "downsizing" of mainframe and minicomputer applications brings mission-critical applications to the desktop, the same rules of the road that governed the much-maligned "glass house" are still going to apply.

Case in point: Oracle recently announced that its Oracle Version 6.0 relational DBMS was available for Novell Netware 386 LANs housed on beefed-up MS-DOS machines [CW, April 29].

While it's true you can go down to Computerland and soup up your Intel 80386- or I486-based machine with more than 10M bytes of main memory and 80M bytes of disk storage to make it all work, those pesky RDBMS planning problems simply won't go away.

Hey, it's like you just left your DEC VAX in the clothes dryer too long. The hardware has shrunk down to size and is thus cheaper to buy. Now, at least some work-group users will have to learn to think like database administrators once Oracle 6.0 is running on a high-end machine. That means files must be labeled properly, naming conventions must be respected, and security levels must be established to access the all-important corporate data.

Network traffic must also

*Continued on page 38*

## AS/400 upgrades' hidden cost

### ANALYSIS

BY MARYFRAN JOHNSON  
CW STAFF

Into every major IBM announcement a few little "gotchas" must fall.

With the dramatically revamped Application System/400 line, customers will find a few unpleasant surprises once they have waded through the hoopla over lower prices and greater performance. Among them are the need to buy new memory and feature cards, a revised pricing scheme for future upgrades of the operating system and a performance degradation for users who run the new version of the operating system on older equipment.

What appears to be the most

### In the know

IBM added three knowledge-based software products for the Application System/400:

- Neural Network Utility/400, enabling users to find patterns and relationships among data elements in a database. One example: a finance company determining the credit worthiness of customers or suppliers within minutes of a query.

- Three new products in The Integrated Reasoning Shell, a knowledge-based platform for applications development. Programmers can use them to build business applications for OS/2, AIX/RISC System/6000, Personal System/2 and System/370 platforms.

- New applications development tools from Synon, Inc., which developers can use to build AS/400 applications for low-end machines, simplify development on high-end AS/400s or port applications among workstation, midrange and host environments.

expensive "gotcha" is memory upgrades, which are mandated when users move from the older

B and C models to the jazzy new D models.

"IBM is offering a financial

### FEATURE: MAINFRAME GUIs

## Trying to find a big-iron interface

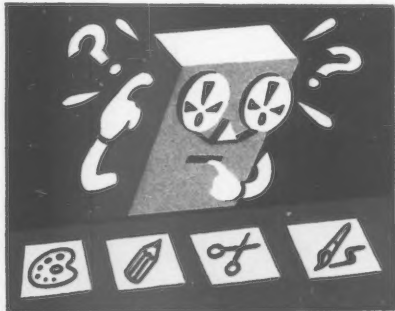
BY JEFFREY N. FRITZ  
SPECIAL TO CW

The need for mainframe access doesn't disappear when you begin working on a personal computer, but the process of achieving that access does become kludgier. Instead of the instantaneous and transparent connection offered by a dedicated terminal, PC users have to make a connection with the mainframe, and they're often stuck with a screen that doesn't behave in any way they're accustomed to.

This was not all that big an issue while character-based interfaces were the norm on PCs. However, with the popularity of Microsoft Corp.'s Windows 3.0 and the ever-increasing importance of Apple Computer, Inc.'s Macintosh, PC users are becoming accustomed to the friendliness of graphical user interfaces (GUI) and less tolerant of overly intricate DOS-style

commands. Users are demanding graphical front ends for mainframe access, and corporate information systems shops are beginning to notice the GUI issue — and the problems that accompany it.

*Continued on page 34*



Richard McGuire

trade-in based on today's memory products, not based on the price the customer originally paid," said Bill Sines, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. "So if you have a \$1,200 memory board that gets replaced with a \$500 board, the credit you get is for \$500 only."

Then again, memory that costs \$1,125 per 1M byte on the older B models now costs \$495 per 1M byte on the D models. While that drastically devalues a customer's current memory boards, it should make future purchases more palatable, analysts suggested.

"Many customers may feel betrayed by IBM, but it reflects the market realities IBM is facing," Sines noted. "They are offering an excellent deal, but there are several things in packaging and memory that can cost money to upgrade."

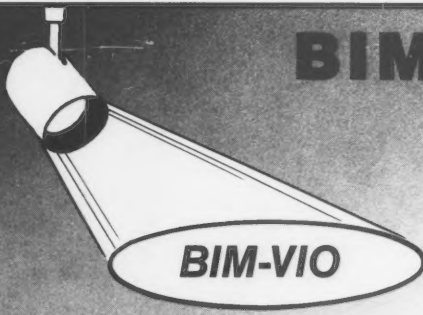
By far, the worst-case scenario will be for those customers who installed third-party memory on their AS/400s, because IBM is offering nothing but regrets when it comes to third-party memory trade-ins.

For Richard Deckard, vice president of data processing at Manheim Auto Auction Division in Atlanta, that "gotcha" will cost \$9,900 per machine on 20 AS/400s with memory boards from EMC Corp. in Hopkinton, Mass. The auction company, which is in the midst of a 46-machine rollout of AS/400s, intends to upgrade those 20 machines to D models running the OS/400 Version 2 operating system.

"What that teaches me is [that] I'd better not buy any more EMC memory," Deckard lamented. "IBM sure got their point across to me."

Yet EMC plans to resolve the incompatibility problem for its customers, said John Ryan, an EMC spokesman. The vendor will swap out its own memory boards and give customers IBM

*Continued on page 39*



## BIM Spotlight

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A built-in feature of the product is that the DOS/VSE Label Area is relocated to the virtual disk. This area is one of the most frequently accessed in most DOS sites, so moving it to the virtual disk should result in significant performance improvement to the overall system, regardless of any other specific use of the virtual disk capability.

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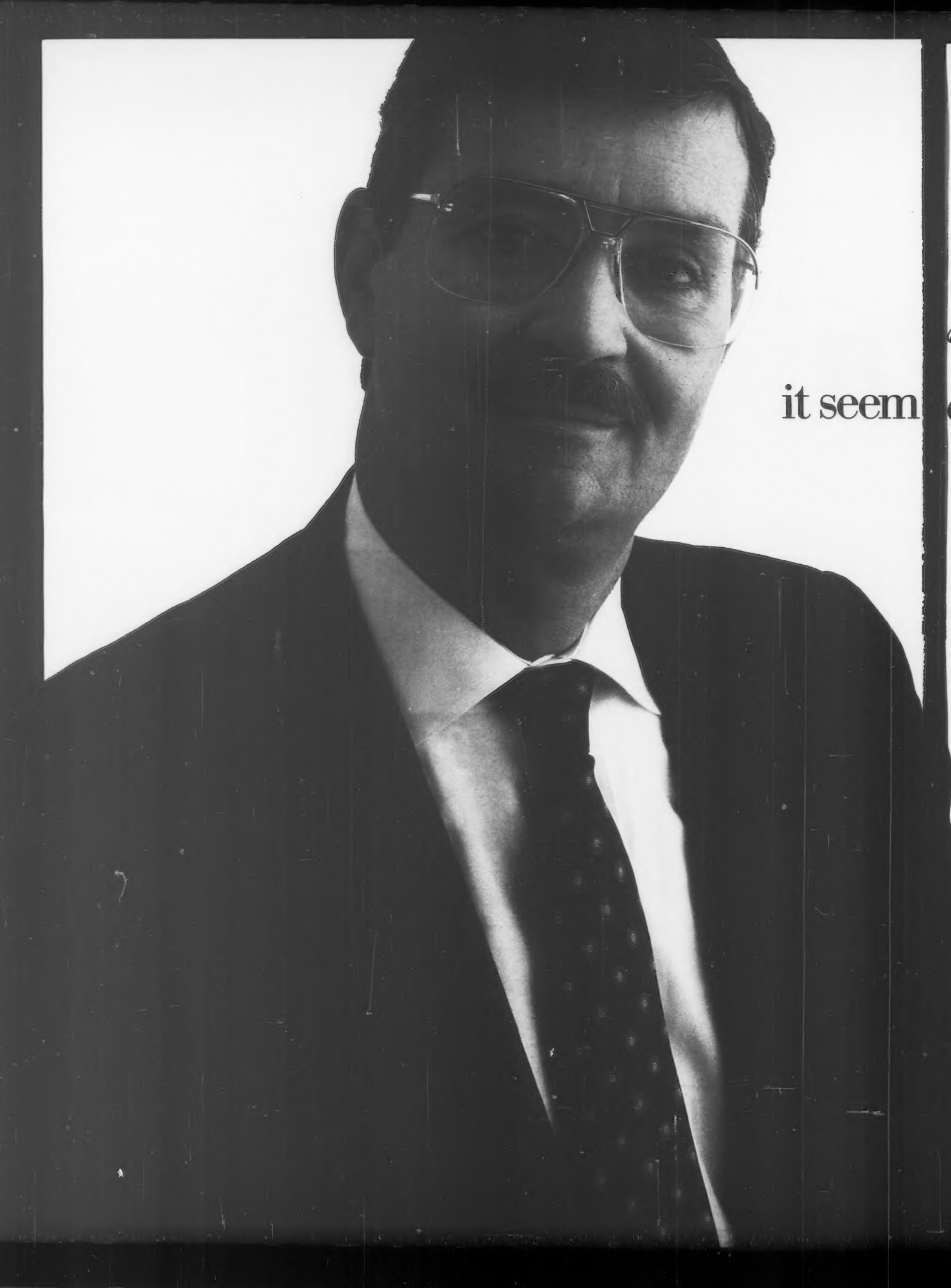
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# "OfficeVision fit our plans so perfectly, ed as if IBM had been reading our minds."

Frank Fitzsimmons  
Director, Judicial Information Systems  
17th Judicial Circuit Court of Florida

The idea for IBM OfficeVision™ wasn't born in a Fort Lauderdale courthouse, but it could have been.

The story begins in 1986 when Florida's 17th Circuit Court started looking for ways to get their multiple systems behaving as one.

Says Frank Fitzsimmons, Director of Judicial IS, "It takes a lot of information to move a case through the courthouse, and we're the ones who funnel it. The trouble was, the big end of our funnel was too big and too complicated. We had office software on one platform, and data on another. And the files—the clerk's, the probation division's, the jury room's and others—were set up differently."

## The plan.

So they mapped out a strategy for improving data access, communications and service for their 65 judges and staffs.

"We needed some standards, and since our data was mostly in an IBM MVS host, we installed IBM electronic mail and were making good progress at integrating applications.

"Then in '89 my IBM rep said, 'Let's go to a seminar.' The subject was OfficeVision, and I sat there amazed. It matched us so well it was like looking in a mirror. Yet it was going to be much easier, more flexible, and SAA™. We installed OfficeVision/MVS in 1990."

The entire judicial system is now using OfficeVision, mostly on IBM PS/2's, connected by Token-Ring LANs. Along with E-mail, calendaring and other office functions, it works with both DOS and OS/2® software, plus CICS applications in three regions on the host.

## The present.

According to Mr. Fitzsimmons,

users and the IS people have both come out ahead.

"It's made life easier for all of us. OfficeVision lets us integrate PC and host applications—across all regions of the mainframe—without making users log on and off all the time. Also, we can customize menus almost instantly. Users see only what they need, and training is easier. We have a help desk, but it almost never gets calls about OfficeVision.

"This place was a paper mill, but no more. And our ability to communicate with each other—remember, we manage the case flow of 65 judges—is vastly improved. Since OfficeVision arrived, we've continually increased our application portfolio and usage goes up 20% every year. That's because people are getting information faster and more easily."

## The future.

Frank also has some thoughts on investment protection.

"In government, you buy things a little at a time. You can't upset the applecart too much. That's what's great about OfficeVision—it wasn't a shock to our system, it fit right in. We're running it with brand-new OS/2 machines and 10-year-old DOS PCs. And we're integrating applications that were written by independent groups around the county.

"And as an SAA application, OfficeVision gives me comfort for the future. There have been skeptics, I know, but SAA is real. It lets me look down the road and see around the corners, to know what'll be there.

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## SOFT NOTES

## Docufile available

San Diego-based Docufile, Inc. has announced that the Docufile data management optical file server software is now available on IBM's RISC System/6000 platform. According to the vendor, the file server connects directly to existing IBM networks and supports multiple jukebox configurations with up to 5 terabytes of data spread over thousands of optical-disc cartridges.

In other image technology news, Bull HN Information Systems, Inc. in Billerica, Mass., introduced an imaging module for its computerized Public Safety Management System. The Imageering Mugmaster Electronic Suspect Image System was designed to aid law enforcement officials in capturing, storing and quickly identifying the images of suspects. It replaces conventional film-camera image verification. The Imageering package operates on Intel Corp. 80386-based personal computers.

Stardent Computer, Inc. recently reached agreements with IBM, Cray Research, Inc. and Sun Microsystems, Inc. to port Stardent's Application Visualization System to computers made by those three vendors. With the addition of the IBM RS/6000, Sun Sparcstation and Cray X-MP and Y-MP families, the graphics and visualization package will run on systems from nine vendors.

## Disaster plan helps Fed bounce back

IS operations shifted, functions restored after flood destroys mainframe

BY MICHAEL FITZGERALD  
CW STAFF

MINNEAPOLIS — A water main break that destroyed a mainframe at the Federal Reserve Bank of Minneapolis last month did not drown the region's financial institutions because of a Federal Reserve System contingency plan.

"The vast majority of institutions took things in stride — there were not delays in giving credit to customers," said Fred Laing, executive director of the Upper Midwest Automated Clearing House Association (UMACHA). "I think the banking industry did a lot to help here, in terms of making sure both retail and corporate customers were made good on funds [the banks] knew were coming through."

Laing said the biggest inconvenience during the first few days was the bank's public insistence that no delays were occurring, when in fact transactions were delayed, though not seriously.

"It was more of a public relations thing than anything else," Laing said.

## A case of backup

When the ceiling water main broke at 1 a.m. on April 8, data service immediately shifted to the bank's backup site in Culpeper, Va., according to Chris Power, media representative at the Minneapolis Federal Reserve. Power said data being processed at the moment of the outage was lost but later recovered successfully.

The Minneapolis Federal Reserve's Amdahl Corp. mainframe handled automated clearinghouse functions for financial institutions in Minnesota, North Dakota, South Dakota, Montana, northwestern Wisconsin and Michigan's Upper Peninsula area. Other bank computers

were unaffected, except for one Digital Equipment Corp. machine that handled electronic mail, which was up and running later the same day.

Institutions that deal with the bank entirely on-line were largely unaffected by the death of the mainframe, Power said. But institutions still using paper and large commercial institutions that took advantage of the data transfer speed of magnetic tape were slowed significantly.

But at least one institution that is entirely on-line with the bank suffered some delays for a couple of weeks.

The Metropolitan Federal Bank FSB in Fargo, N.D., did not regain full processing capabilities until April 22, according to J. B. Berg, Metropolitan's assistant vice president.

"It definitely slowed our processing down," Berg said. Transactions normally processed in the morning did not get done until afternoon or evening. Berg added that "it didn't affect

**T**HE VAST MAJORITY of institutions took things in stride — there were not delays in giving credit to customers."

FRED LAING  
UMACHA

our customers at all, just settlements."

Laing said paper and tape transactions are still delayed at least one day but noted that the region's major banks used their own contingency plans, which included converting tape files to electronic data, and thus avoided delays. Otherwise, the impact of the problem was slight.

The National City Bank of Minneapolis, which is held by National City Bank Corp., had some employees work overtime for several days, said Donald Kjonaas, senior vice president of operations for the bank. Kjonaas said the overtime was needed to ensure all transactions were processed correctly.

Laing said processing returned to normal for most area institutions on April 11, after the

bank decided to double the number of lines coming into its Culpeper backup site. Prior to then, two- to four-hour delays in connection were not uncommon, he said. The mainframe in Culpeper also went down for a short time during the first two days.

The most direct impact suffered came from direct-deposit payments that were not made on time and did not register on automated teller networks. Laing said that in many cases, financial institutions operated on trust and established relationships to honor payroll checks and complete deals.

## HP establishes life-support center for aging software

BY J. A. SAVAGE  
CW STAFF

ROSEVILLE, Calif. — Where does aging software go when it is on its last legs? Some vendors unceremoniously send it to an unmarked grave, leaving users to mourn their investment in new software.

However, Hewlett-Packard Co.'s customers recently persuaded the company to put some major software packages on life support. HP said it was going to cut off maintenance for its Rapid and Transact products.

"Customers came to us and said they would be willing to pay more just to keep them around," said Tony Engberg, research and development laboratory manager at HP's Advanced Systems Division Software Technology Center.

That was eight months ago. "Users told us they had made large investments in the software, and they saw no need to migrate to new platforms and packages," Engberg said. He and other HP officials were taken aback by the strength of customer reaction to their decision, so after reviewing its original decision, HP made an about-face.

It assigned those packages that run on the company's "classic" or complex instruction set

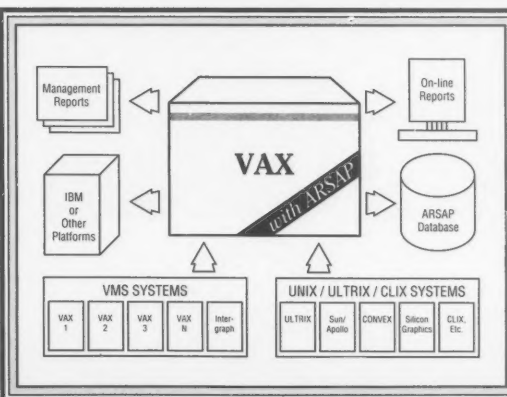
computers, as well as the MPE V operating system for those platforms, Allbase 4GL and Business Report Writer, to Roseville for continuing life support and enhancements. In the last six months, the center has grown from 35 to 135 engineers.

## Higher fees

While customers have agreed to pay higher fees for services they request, HP has not yet added any premium, according to Susan Cook, product marketing manager at HP's Application Support Division. "On some very localized products, we might ask for more," she said. She added that it was too early to tell whether the change of heart will cause an increase in maintenance renewal rates.

"The fundamental premise is that if you do the right thing for customer satisfaction, it should also make a good business decision," Cook said.

However, it is costing the vendor some capital up-front to keep this software alive. "HP made the decision to get out of the business, and that software just languished for maybe six months," Engberg said. "During that time, it doesn't just sit there; it gets messy and it takes an investment in additional head count to fix it up."



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## Big-iron

FROM PAGE 29

Once users accustomed to GUIs enter a mainframe session, life changes dramatically; suddenly, they are confronted with a radically different interface. This is a problem not only on the corporate mainframe but also with mainframe-based on-line bulletin board services. A few, such as America Online and Applelink, provide an intuitive graphical interface, but most do not. Mainframes expect command-line or, at best, function-key input from the user. That means the user has to perform mental gymnastics to interact with the mainframe: "Let's see, I use F3 to quit, and I press F5 to send electronic mail messages, but I use F11 to read incoming E-mail." Clearly, this is not a very intuitive way of computing.

Terminal emulation software is usually not much help either. Most emulation interfaces are not very graphical. Even emulators that are written expressly for graphical interfaces often lack GUI features; such emulators use a character-based interface running inside a graphical window. Users complain that the emulation interfaces are not consistent with the other GUI pro-

grams they use every day.

To be fair, IS managers do have worries other than arranging a GUI for their mainframes. They have to be concerned about guarding valuable mainframe CPU cycles and ensuring that interface conversion software does not place a heavy burden on the system. IS directors argue that if excessive mainframe cycles go into front-end conversion, serious processing shortages can result elsewhere. Preventing this usually means doing the graphical conversion on the local PC.

Unfortunately, this solution has similar drawbacks. CPU cycles, in this case from the user's microprocessor chip, are necessary to do the conversion and must come from somewhere.

### Implementing GUIs

There are two approaches to implementing graphical front ends. The intrusive front-end approach requires programmers to write front-end code on the host. This code is interspersed with host application code. GUI support is largely done on the mainframe side.

On the other hand, nonintrusive code leaves the host code intact. The interface coding is done on the PC or Macintosh. Although this approach lightens

the load on the mainframe, many IS programmers are not PC- or Macintosh-literate.

Some attempts have been made to balance loads between

the mainframe and local computer. For example, the Apple Terminal Service (ATS) protocol, which should soon run with non-Apple interfaces, provides a

high-level message passing environment. The host programs control — but do not support — the graphical windows. Printing and filing are also handled by the local CPU. The arrangement has been used successfully in several university environments. For example, the University of Michigan and Baylor University both support campuswide graphical interfaces using ATS.

Apple has also addressed the GUI issue with Macworkstation, a distributed user interface that gives host applications the look and feel of desktop GUI applications. It runs as a server application on a local Macintosh that understands ATS. The Macintosh provides all desktop services for the host application. Apple says IS departments and systems integrators can use Macintosh-style windows, pull-down menus and dialog boxes within their host-based applications. However, IS departments must still write mainframe code to accompany the tools provided by Macworkstation.

The cries of GUI supporters are also being heard by third-party software and hardware developers. With many more users clamoring for intuitive front ends, several vendors have set out to find a better way of providing user interfaces for main-

## GUI-bound

Not all companies duck the issue of a mainframe GUI. Southern New England Telephone (SNET), which has been primarily a DOS shop with 3,000 PCs and 400 Macintoshes, has made it a priority to get an interface that will work across all of its platforms, says Ben Sevier, desktop technology consultant at SNET.

Sevier has been frustrated in his efforts to find a mainframe GUI that embraces multiple platforms. "We have a large number of old but stable programs that run on VMS and VM systems. We want to keep the programs but replace the interface. Vendors have promised us cross-platform GUI solutions, but it is very hard to find those who can actually produce such solutions," he says.

However, IS departments are often averse to the idea of supporting GUIs on mainframes or writing GUIs to front-end mainframe applications. Harry Leverette, information resource coordinator at the Harris County (Texas) Criminal Courts, encountered great reluctance when he proposed adopting a graphical interface for Macintosh connectivity to an IBM 3090.

"The initial response of our MIS department to graphical front-ending was less than encouraging. They pointed out that modifications to host applications occur so frequently that front-end development couldn't possibly keep pace. They also argued that using custom front ends would undermine the consistency of the host application and disorient our users as they move around in the organization," Leverette says.

JEFFREY N. FRITZ

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frame communications. A package called Masquerade from Connectivite fully supports a GUI mainframe interface for the Macintosh, although users must create their own screens through a Macdraw type of interface. Mitemview, by Mitem Corp., is a GUI front end that is compatible with several IBM 3270 emulation cards. Mitemview will work with the Mac-mainframe card from Avatar Technologies, Inc. as well as Simware, Inc.'s Simmac and Apple's MacDFT hardware.

Such interfaces provide a decent solution to the GUI problem but not without cost. Ben Sevier, desktop technology consultant at Southern New England Telephone in New Haven, Conn., says, "Masquerade does a good job of integration with the Mac interface, but there is a performance penalty exacted by the behind-the-scenes processing." Sevier reports experiencing much the same problem with user-designed Hypercard front ends.

Not all agree. Harry Leverette, information resource coordinator at the Harris County Criminal Courts in Houston, sees it slightly differently: "Masquerade appears to be an exceptionally quick development environment. Because it uses the Mac

interface instead of a scripting language to build front ends, the whole process is comparable to building a database. Of course, the few MIS representatives whom we have enticed into a demo of our graphical interfaces still think we're hiding the code somewhere."

There is beginning to be some development of interfaces for platforms other than the Macintosh. For example, ALAC by United Data Corp. is a Windows AT-compliant server that provides PC users with a graphical interface. XMWS, from Integrated Solutions, Inc., provides similar support for X Window System workstations. For asynchronous PC users running Windows, Digital Communications Associates, Inc. offers Crosstalk for Windows. Other GUIs are sure to follow.

The task facing GUI enthusiasts is to convince IS personnel that the work required to produce and support a graphical interface is worth the effort. Leverette says: "Really, the responsibility for [GUI] innovation rests with end users, and it's up to us to articulate a vision that MIS can share and support."

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

## Interface laser to meld IBM, HP capabilities

BY CAROL HILDEBRAND  
CWS STAFF

ANN ARBOR, Mich. — Hoping to please all of the people all of the time, Interface Systems, Inc. announced an IBM-compatible mainframe and midrange laser printer based on the same engine that drives Hewlett-Packard Co.'s popular Laserjet printer.

The ISI 7028, which is aimed at the IBM 4028 printer market, supports IBM's Intelligent Printer Data Stream (IPDS) page description protocol, the standard protocol for Systems Application Architecture (SAA), as well as Advanced Function Printing, the presentation component of SAA.

The printer can be connected to a host via internal coaxial or twinaxial interfaces and can also port to personal computer or local-area network connections, allowing it to be shared by several systems.

According to Hal Davis, marketing manager at Interface, the printer will automatically switch among the systems. It will also

print double-sided pages, which the 4028 cannot do, he said.

Davis added that with the mainframe printer market moving increasingly toward distributed printers, a large, 200 page/min printer in the data center does not always make sense. "Just because it's a mainframe print job doesn't mean it's a thousand pages long," he said.

The added familiarity of the Laserjet engine should also be a draw, Davis said.

"Since it's familiar to people, they already know how to take care of it, what paper works and what doesn't work," he said.

Industry analysts were not in full agreement, however. According to Mark Boer, senior market analyst at BIS Strategic Decisions in Norwell, Mass., the market is somewhat limited. "There are others out there making IPDS printers," he said.

The printer, which the company said should be available in July, will sell for about \$5,000.

### NEW DEALS

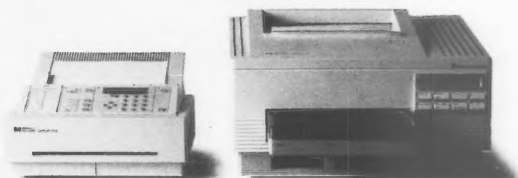
## MIT to get VAX 9000

Digital Equipment Corp. will be providing a VAX 9000 high-performance vector computer to MIT in Cambridge, Mass. The \$3.8 million computer will be delivered as part of a research agreement with MIT and will include disk storage, connectivity equipment, Version 4.2 of the DEC Ultrix operating system and several layered software products. According to Professor James D. Bruce, vice president of information systems at MIT, the sys-

tem will be used for a variety of scientific applications as well as for economic research.

The Budapest Bank, the third largest commercial bank in Hungary, has purchased a Bull 7000/310 computer from Groupe Bull in Paris. The contract, valued at about \$7 million, also includes 60 Bull DPX/2 systems and clusters of Bull Questar 310 terminals. Deliveries are scheduled to begin in the second half of 1991.

## Introducing plain paper faxing for your HP LaserJet printers.



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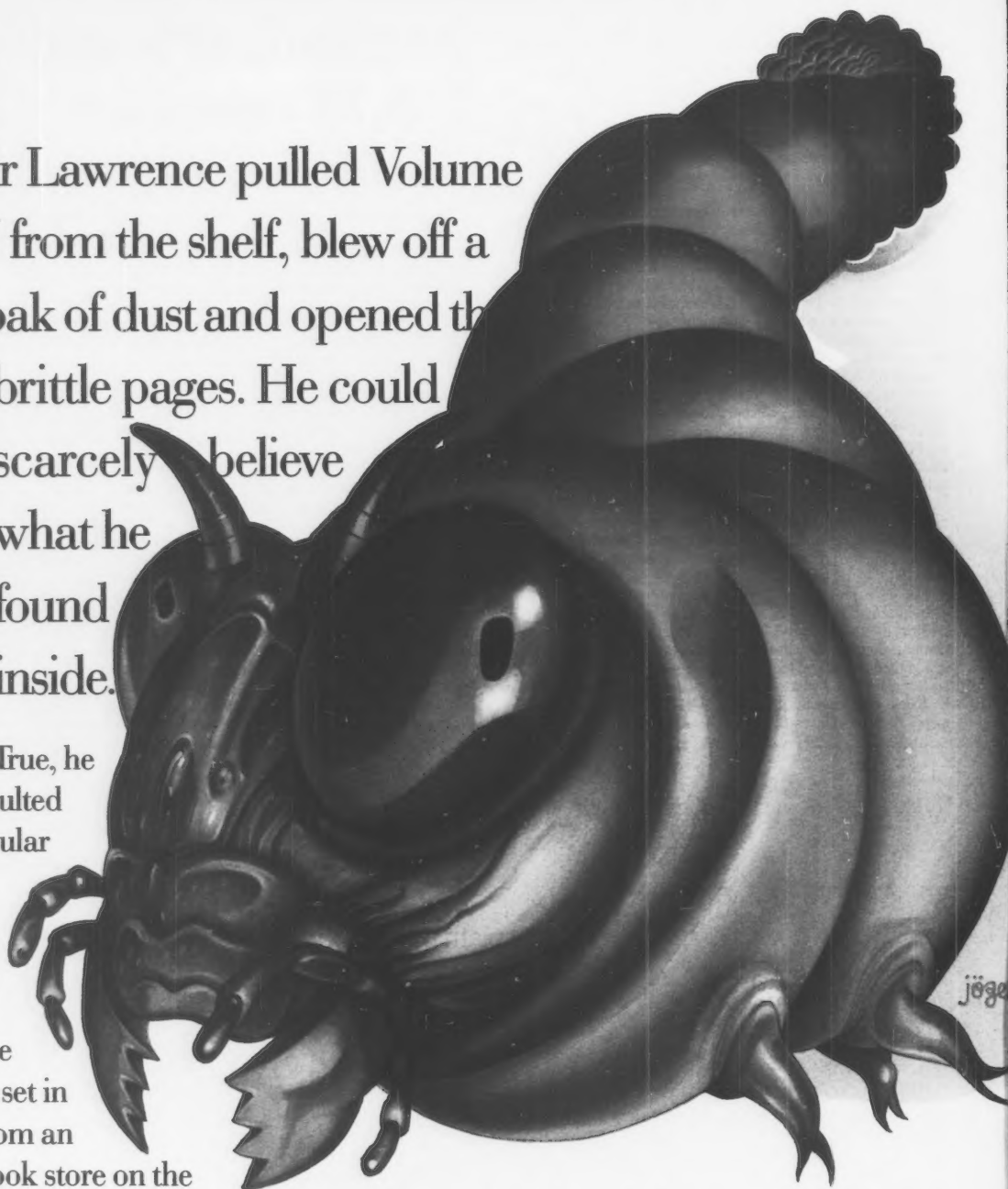


S
 ir Lawrence pulled Volume IV from the shelf, blew off a cloak of dust and opened the brittle pages. He could scarcely believe what he found inside.

True, he hadn't consulted these particular journals in years and, admittedly, he had acquired the ten-volume set in his youth from an odd little book store on the

Thames, but still! Holes!? A bookworm had eaten clean through the pages. Indeed, to Sir Lawrence's considerable chagrin, he found the ravenous little bugger had chewed, in a straight line, from the front cover of Volume I to the back cover of Volume X.

All of which brings us to our seemingly simple question: If each book is exactly two inches thick, how far did the bookworm travel?



In tussling with this type of cerebral aerobics, most people make a simple but serious error: They *assume* something. Of course, this happens without realizing it. But still, it happens.

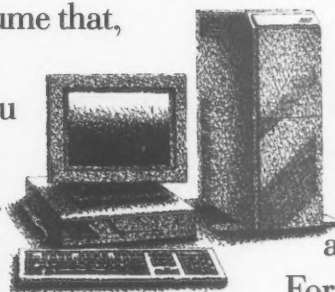
As you'll see in a moment, the way to avoid making a false assumption is to work things out methodically. Carefully thinking through each step.

For instance, consider this question. A company makes one of the broadest lines of computer terminals in the world. They have for years. In fact, they've delivered over three million of them.

If you needed terminals you'd probably think of them. But what if you needed PCs? Would you assume that, since this company is so dominant in terminals, they must

Tsk, tsk. Have you

Well, as you may have *correctly* assumed, the company in question is Wyse. And if you've been assuming we don't have an impressive array of powerful, priced-right PCs it would be a shame.



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Consider our models that offer a rich new Decision Series. Four set of features. Generous power supplies, three styles of ergonomically advanced chassis, multiple configurations, popular Wyse-designed keyboards, aggressive pricing and bundled DOS 4.01.

The Decision Series PCs: 386sx/16s (shown), 386sx/20, 486/25, 486/33E (shown). Advanced ergonomics, finicky attention to detail, exceptional power for the dollar.

For starters.

Of course we realize there's a good chance some of you may have read this far because you're more interested in the answer to our puzzle than in our products. You've *assumed* we'd bury the answer down here somewhere. Well, you're wrong again. At least partially. So go look on page 90.

Now that it's clear we make an impressive line of PCs, you might be tempted to assume we stop there and don't get into the even more sophisticated products like super fast multi-processing systems for the UNIX environment. With speed in the 100 MIPS range.

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## Bozman

CONTINUED FROM PAGE 29

be controlled by deciding how much data will be generated and stored locally by the work group — and how much must be accessed from the enterprisewide data network.

The very same "warning label" about LAN database servers could apply to a variety of OS/2 server products, including the Microsoft Corp./Sybase, Inc. SQL/Server, Gupta Technologies, Inc.'s SQLbase and even Oracle's Oracle Server for OS/2.

Industry analysts such as Stuart Woodring at Forrester Research in Cambridge, Mass., think a lack of proper development tools and third-party support kept OS/2 database servers from taking off.

Even though Novell, Oracle and third-party systems integrators say they're standing by to help in case of a work-group RDBMS emergency, there's a lot you must do for yourself. That could include archiving daily copies of the database and scheduling batch updates from other hosts, such as DEC VAXs and IBM mainframes. Either there are going to be

**N**OW, AT LEAST some work-group users will have to learn to think like database administrators once Oracle 6.0 is running on a high-end machine.

a lot of DBMS training classes for end users who want to acquire these skills, or there's going to be greater cooperation among work-group LAN managers and central information systems applications developers.

Will end users take the time to think all these problems through? Not right away, if experience serves as a guide. Rather, the problem will creep up on LAN managers as servers for 10 people grow into servers for 30, 40 or 50 people. Let's call that process "upsizing" from now on, for the ability to outgrow one's PC applications — including a PC database.

Oracle planners recommend trying out their new Netware-compatible system on a single machine — the same MS-DOS computer that also acts as a LAN file server. But large user logon lists will inevitably prompt system reconfiguration, Oracle product manager Doug Laird says, and that means database and file-server functions must be split between two LAN machines.

So, PC revolutionaries of the '80s, take note: You have reached a watershed in your relationship with IS managers. You broke away from the glass house and performed history's greatest end-run in computing when you acquired your own CPUs. You said the glass house was hopelessly mired in applications development. You were absolutely right. But now that the power to host databases falls into your hands, you may finally call on the IS establishment for help — or at least for guidelines on how to proceed. It's about time.

Bozman is *Computersworld's* West Coast senior editor.

## Bull HN announces high-end storage options

BY SALLY CUSACK  
CW STAFF

BILLERICA, Mass. — When Bull HN Information Systems, Inc. added several new mainframe computers to its 9000 series recently, it used the opportunity to introduce several mass storage subsystems and a cartridge tape library.

Targeted at users with large-capacity storage requirements, the Bull MSU8390 disk drive series is available through an OEM agreement with IBM.

It is comparable to the IBM 3390 series of drives and is offered in five models providing as much as 121.2G bytes of

high-end storage capacity.

This includes two head-of-string units and three secondary units, which can be attached to the DPS 9000 via a 4.5M byte/sec. channel on a Bull controller.

Pricing ranges from \$130,500 for the MSU8390 head-of-string unit with 7.568G bytes of unformatted storage capacity to \$283,300 for the 22.704G-byte MSU8394 secondary disk drive.

Roy McRee, general manager at Graybar Electric Co. in St. Louis, recently ordered several IBM 3390 disks for the company's Bull 9000 system.

He said he anticipates ordering the Bull products next year as the necessary

system software becomes available for Graybar's particular platform configuration.

The newly announced Cartridge Tape Library System, supplied by Storage Technology Corp., stores as many as 6,000 tape cartridges.

Minimum configuration prices range from \$470,635 for a 3,000-tape library system to \$554,635 for a 6,000-tape configuration.

The Los Angeles County Office of Education, which now uses reel tape technology, indicated it has no plans to upgrade disk storage at present but is interested in experimenting with tape cartridges.

SANDRA KURTZIG, CEO OF ASK COMPUTER SYSTEMS:

"If GUI application developers could be ten times more productive, what would that do for client-server computing? We're about to find out."

*In December, 1990, ASK Computer Systems acquired Ingres, the acclaimed manufacturer of intelligent relational database products. Here, CEO Sandy Kurtzig discusses the dramatic productivity increases reported by developers using INGRES/Windows 4GL, the first complete application development environment for graphical user interfaces:*

"I don't see how anyone can keep from getting as excited as we are about client-server computing. The amount of information it puts at the fingertips of the end user is just phenomenal.

"You'll drastically reduce the code you now have to write."

"Of course, that much information can be frustrating—even useless—without an easier way of viewing it. That's where graphical user interfaces are



coming into their own. They make vast amounts of data easy to work with, and quick to comprehend.

"But writing GUI applica-

tions using a conventional programming language is incredibly tedious. It requires hundreds of thousands of lines of code—60 percent of which do nothing but



## Object-oriented firms blend assets

MOUNTAIN VIEW, Calif. — East met West in a joint development and marketing agreement between two prominent object-oriented technology companies. Parplace Systems, Inc., based here, and Object Design, Inc. in Burlington, Mass., said recently that they would work to integrate Parplace's Objectworks C++ object-oriented language with Object Design's object-oriented database management system.

Together, the products will link object definitions with storage in Object Design's Objectstore DBMS, which runs on many Unix workstations.

Complex data objects could be re-

trieved for reuse in new applications programs as well.

Objectworks C++ includes a source browser with multiple views, AT&T's C++ Language System Release 2.1, a built-in debugger and a mouse-oriented editor.

The Objectstore DBMS, priced between \$2,000 and \$6,000 per end user, is aimed at computer-aided design/engineering, simulation and imaging applications, among others.

Objectstore is used by several large end-user organizations, including aerospace and chemical companies.

JEAN S. BOZMAN

## AS/400 upgrade

CONTINUED FROM PAGE 29

memory. The EMC users can then trade in that IBM memory for D model memory. Once EMC comes out with its own D model memory products — in three to six months — the vendor will make another swap and replace the IBM memory with EMC products, Ryan said.

Follow that?

Another minor annoyance for IBM customers may crop up with the feature cards on the new high-end machines. Users moving to D50 and larger models will find that some feature cards — such as the magnetic storage device controller and certain communications lines — will

not transfer from the older models, said Tony Membrino, an analyst at Technology Investment Strategies.

"The original prices on these cards may have been as high as \$3,000 or \$4,000, so it's not a lot of money," Membrino said. "IBM is offering 50% price re-

**U**SERS WHO DALLY beyond September 1992 will have to pay for an operating system upgrade.

ductions on the new feature cards, but that reduces the price of what the used B model feature cards will bring."

IBM is also determined to upgrade a substantial number of the 100,000 installed AS/400s to the new machines. Users who dally beyond September 1992 will have to pay for an operating system upgrade — a first-ever event in the IBM midrange.

Finally, it is unclear how much tweaking will be necessary to move applications from the B models to the D models, despite their object compatibility.

"One of our concerns is that we're getting the [Model D80] machine before some of our smaller software vendors get one," said Eric Corbman, director of development at Tiffany and Co.'s data center located in Parsippany, N.J. "If there are problems, we'll have to fight them ourselves."

Whatever "gotchas" may exist for the D models, however, may not count for much when users consider cost of ownership, according to Robert Djurdjevic, president of Annex Research in Phoenix. He said he figures the three-year cost of hardware, software and service for a B35 model to be \$50,400, while a D35 would cost \$57,800 for the same period. "Still, you have a 43% increase in performance for a less than 15% increase in cost," Djurdjevic noted.

### INFORMATION SYSTEMS FOR BUSINESS

produce the GUI itself. Add that to the problems of accessing data from multiple sources, a shortage of developers, and a steep learning curve for existing GUI tools, and you're talking a huge investment of time and money. No wonder client-server applications have been so slow in coming.

"A product that makes programmers up to ten times more productive."

"Well, all that's going to change once developers get their hands on INGRES/Windows 4GL — a tool that helps programmers be up to ten times more productive. At least, that's what some of our customers tell us.

"For starters, INGRES/Windows 4GL allows you to use a mouse to interactively build windows and menus without writing a line of code. Then you assign functions to those components using a very elegant fourth generation language, which a good 3GL programmer can learn in a week or less.

"So, applications that once required thousands of lines of code now take far fewer.

"Unlike simple screen painters and HyperCard-like tools, INGRES/Windows 4GL is designed for full-scale production applications. It helps you manage and coordinate multiple development teams. It even tracks different versions of your applications throughout the company. No wonder it's now being used to create sophisticated applications like shop floor control and critical care medical systems.

"Portability is one of this tool's most profound breakthroughs. An application you create in, say, OSF/Motif will be able to run flawlessly on Windows 3.0, Open Look and other popular systems. With the appropriate look-and-feel in each environment. With full interoperability with other applications. And with no rewriting.

"Your applications will also link seamlessly to the whole range of Ingres products, and — thanks to INGRES/Gateways — to other leading databases.

"Think about it: Client-server applications with GUIs and full portability, in a fraction of the time. This could be the product that finally opens up the workstation for mainstream commercial applications.

"I think it's fair to call it revolutionary."

INGRES/Windows 4GL supports Sun SPARC, DEC VAXstation/VMS, DECstation/ULTRIX, HP 9000, IBM RS/6000,

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In December, 1990, Ingres Corporation was acquired by ASK. For more than ten years, Ingres has been a worldwide technology leader in database management systems. The family of Ingres products includes: the first intelligent relational database; the first Windows 4GL development toolset; gateways to the most popular non-Ingres systems; powerful desktop solutions; and global customer support. Ingres' reputation for technological excellence was most recently confirmed by Digital Review — the magazine's 1990 Editor's Choice, Best Database Management Software, and Best Database Tools awards went to Ingres — as did the Sun Observers' excellence award for Best Database Management System.

and other major workstation platforms. To learn more about INGRES/Windows 4GL, call 1-800-4-INGRES.

## ASK

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## NEW PRODUCTS — HARDWARE

## I/O devices

Lansystems, Inc.'s Network Products Division has announced a print server designed to support the high-speed graphics printing features of Hewlett-Packard Co.'s Laserjet IIISI printers.

Lanspool SI operates in conjunction with the Laserjet IIISI's Token Ring or Ethernet network interface cards to send data directly to an SI printer at the printer's operating speed of 100,000 char./sec.

The product is priced at \$395 per printer. HP is now bundling a test version of Lanspool SI with every network printer interface card for the Laserjet IIISI printer.

**Lansystems**  
300 Park Ave. South  
New York, N.Y. 10010  
(801) 379-2200

Printek, Inc. has announced a series of printers designed for environments that print various multipart forms, such as purchase orders, invoices and bills of lading.

The Formspro 4000 series includes Model 4003, a device that allows three forms to be continuously loaded through a straight-up paper path.

The printers feature a 400 char./sec. drafting speed that enables users to print a 1,000-character form in less than six seconds, the vendor said.

Pricing ranges from \$2,595 to \$3,295, depending on type of model. Twinaxial and coaxial interfaces are available at additional cost.

**Printek**  
1517 Townline Road  
Benton Harbor, Mich. 49022  
(708) 260-7705

Printronic, Inc. recently announced the P9012-CH Line-Matrix Printer for operation in the IBM System/370 channel environment.

The product prints at speeds of up to 1,200 lines per minute and includes standard features such as multinational character sets and a ribbon-quality monitor.

Options are available to extend ribbon life, improve paper handling and simplify printing of forms.

The price of the Line-Matrix Printer is \$21,495.

**Printronic**  
17500 Cartwright Road  
Irvine, Calif. 92713  
(714) 863-1900

## Data storage

Micro Technology, Inc. has introduced the MDI-79 Series drives for Digital Equipment Corp. VAX/VMS environments.

The drives recognize all VMS disk commands and support all DEC diagnostics, according to Micro Technology. Average disk access time for the series is reportedly 20.6 msec.

Pricing ranges from \$9,872 to \$33,372.

**Micro Technology**  
5065 E. Hunter Ave.  
Anaheim, Calif. 92807  
(714) 970-0300



**The enhanced Wide Word System 2000 offers up to 2.5G bytes of RAM**

The Wide Word System 2000 solid-state mass storage product line has been upgraded by Dataram Corp.

The enhanced products offer up to 2.5G bytes of random-access memory capacity in a single chassis, with 160-bit wide word architecture and 32-bit addressing. The systems can be daisy-chained. Models with 200M- or 400M-byte/sec. data retrieval bandwidth are available.

Pricing starts at \$43,000.

**Dataram**  
Route 571  
Princeton Road  
W. Windsor Township, N.J. 08543  
(609) 799-0071

## Processors

Aptec Computer Systems, Inc. has announced the VSP-2, a vector/scalar processor for its IOC-100 and IOC-200 high-performance Digital Equipment Corp. VAX/VMS environment computers.

The Aptec I/O computers (IOC) manage data transfers via a parallel bus at

throughput rates of up to 200M byte/sec. The add-in VSP-2 board gives IOC systems computational power of 150 million floating-point operations per second. IOCs connected to VMS systems and peripherals boost overall system speed by supplying high-speed data streams, according to Aptec.

The VSP-2 costs \$60,000.

**Aptec Computer Systems**  
8405 S.W. Nimbus Ave.  
Beaverton, Ore. 97005  
(503) 626-9000

Digital Equipment Corp. has announced the VAX 4 upgrade program for Microvax II and Vaxstation II/GPX systems users.

The board-level upgrade will increase performance more than 5.5 times while allowing users to retain existing I/O and storage options, according to DEC. The plan requires trading in the current processor and memory module, according to the vendor.

Pricing for the upgrade ranges from \$14,000 to \$50,000.

**DEC**  
Digital Drive  
Merrimac, N.H. 03054  
(603) 884-8900

## SOFTWARE

## Development tools

Software Components of Colorado, Inc. has announced Destiny, a portable C language programming library.

Destiny includes more than 150 reusable C language functions grouped in categories such as calendars, financial calculations and character strings. The product is currently available for VAX/VMS, RISC System/6000 ALX, PC-DOS and The Santa Cruz Operation's SCO Unix systems.

Licenses are priced from \$175 for a single-user personal computer to \$2,990 for a large Digital Equipment Corp. Vax-cluster. There are no royalty charges for software developers.

**Software Components of Colorado**  
6575 Denim Drive  
Colorado Springs, Colo. 80918  
(719) 531-6940

## Utilities

Vista Control Systems, Inc. has announced Vsystem, a networked data acquisition and control software package for Digital Equipment Corp. VAX/VMS and VAX/ELN environments.

The graphical product is built around an extensible real-time database of access routines. Other components of the package include a database generating utility, a data output logger, an alarm message system and a command sequence controller usable by nonprogrammers.

Vsystem is priced by individual component. For a typically configured system, the product can be implemented for less than \$25,000, according to the company.

**Vista Control Systems**  
134-B Eastgate Drive  
Los Alamos, N.M. 87544  
(505) 662-2484

SAS Institute, Inc. has added Projman, a project management menu system, to the company's Applications System software package.

Projman offers a point-and-shoot environment for data entry, project schedul-

ing and high-resolution graphics report design and output.

The menu system is available free of charge to users of SAS/OR, the project management component of the SAS Applications System.

**SAS Institute**  
SAS Campus Drive  
Cary, N.C. 27513  
(919) 677-8000

Compuware Corp. has introduced CICS Radar 3.1, a systems failure locator package.

Version 3.1 supports IBM CICS architecture Release 3.1.1, as well as previous releases of CICS. It displays and analyzes information relevant to regional systems failures. According to Compuware, the product supports a variety of IBM dump formats and includes its own Fast Dump feature.

A site license costs \$25,100.

**Compuware**  
31440 Northwestern Highway  
Farmington Hills, Mich. 48333  
(313) 737-7300

## Applications packages

Extol, Inc. has begun shipping the Extol EDI Integrator for the IBM Application System/400.

The electronic data interchange (EDI) management product includes an event-driven high-speed translator, code translation capability and support for all major EDI standards and conventions based on X.12 or Edifact syntax. All major networks are reportedly supported. According to Extol, the Integrator facilitates the integration of EDI with the user's application database.

Pricing starts at \$10,000, including one year of maintenance.

**Extol**  
99 North Line St.  
Frackville, Pa. 17931  
(717) 874-0695

Information Builders, Inc. has released Foccalc 2.0, a spreadsheet integrated with Focus 6.5, the company's multiplatform, fourth-generation development language.

According to the company, Foccalc 2.0 provides numerical analysis and spreadsheet formatting comparable to that of microcomputer-based spreadsheets. The integration with Focus gives Foccalc users access to data in IBM's DB2, SQL/DS and other mainframe databases, as well as to data in Digital Equipment Corp. VAX and personal computer environments, the company said.

Pricing for Foccalc 2.0 ranges from \$15,000 to \$25,000. A leasing option is available.

**Information Builders**  
1250 Broadway  
New York, N.Y. 10001  
(212) 736-4433

Speedview 1.0, an automatic report distribution software package for IBM MVS data centers, has been announced by Cybermation, Inc.

The product allows local and remote end-user report printing. It also offers security features and automates report archiving and purging.

Pricing starts at \$17,000.

**Cybermation**  
16 Esna Park Drive  
Markham, Ontario L3R 5X1  
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# PCs & WORKSTATIONS

## MICRO BITS

### Two more for PCXI

The PCXI Consortium recently announced that Intel Corp. and Bitwise Designs, Inc. had become members of the Seattle-based personal computer standards group. The consortium also announced the creation of an Extended Industry Standard Architecture (EISA) Passive Backplane Standards Committee. The committee is intended to define a standard that will allow industrial end users and OEMs to mix EISA single-board CPUs and backplanes from different manufacturers.

Helix Software Co. has announced an MS-DOS 5.0-compatible memory manager designed to enhance the memory control capabilities of Microsoft Corp.'s latest version of the DOS operating system. Both products are due for release this summer. Netroom Version 2.0 allows users of 386-based systems to move terminate-and-stay-resident programs and device drivers into high memory, thereby providing more memory for use by applications. A single-user license is priced at \$79.

## Hopes sky-high for I486SX

PC vendors plugging for new high-performance computing standard

BY RICHARD PASTORE  
CW STAFF

Personal computer vendors, who wasted no time in unveiling Intel Corp. I486SX-based systems earlier this month, said they hope the PCs will shortly become the corporate standard for high-performance desktop computing. If price/performance values fulfill analyst expectations and vendor claims, the PC makers

may get their wish.

Immediately following Intel's debut of the math coprocessor-less 486, IBM, AST Research, Inc., Advanced Logic Research, Inc., Acer America Corp. and Everex Systems, Inc. unveiled boxes. In addition, Hewlett-Packard Co., Dell Computer Corp., Wyse Technology and Compaq Computer Corp. announced their intent to develop systems.

Aside from IBM's [CW, April 29], the new systems range from \$3,000 to \$6,000 for realistic configurations and will deliver 12 million to 16 million instructions per second (MIPS) performance. That figures out to a 35% performance boost vs. comparably configured Intel 80386DX-based boxes, according to Technology Investment Strategies Corp. (TISC) in Framingham, Mass.

For most applications, users will not miss the math coprocessor, analysts said. However, high-end spreadsheets, graphics and design applications do take advantage of the coprocessor, which may be added to the 486SX if needed.

The net result, according to TISC analyst Scott Stein, is that 486SX systems will become the strategic business workstation of choice by mid-1992.

Some vendors are making their initial forays into this market hard to resist. AST has priced its introductory Premium II 486SX 45% lower than its  
*Continued on page 46*

## Mainframes stalled in wake of micro performance gains

BY MARK AMES  
SPECIAL TO CW

There have been endless predictions of the demise and rebirth of mainframes. The market for minicomputers has grown and is now in a midlife crisis, and everyone is being inundated by the overpromotion of personal computers. What, really, is happening?

The truth can be elusive and hidden behind hyperbole, marketing hype and the shadow of vested interests. It is difficult to find an objective comparison of the processing capabilities of the various processing architectures. If an objective comparison does exist, it is not easily identifiable.

For example, Intel Corp.'s I486 chip has arrived, and its performance can be called "awe-

some." It has been rated as high as 20 VAX MIPS.

Mainframe performance has traditionally been measured in millions of instructions per second (MIPS). The IBM mainframe instruction set has remained reasonably stable for more than 20 years, but the instruction set on a PC or a Digital Equipment Corp. VAX is significantly different from that of the IBM mainframe. It is misleading to compare PC MIPS or VAX MIPS to 3090 MIPS. While a figure of 20 MIPS sounds impressive, is it real or just more hyperbole?

To evaluate the power of the PC, it is necessary to calibrate PC performance in the most widely used measurement unit: mainframe MIPS.

To this end, a measuring stick that represented the large vol-

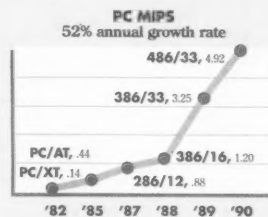
ume of mainframe application programs was developed. A Cobol program that performed typical business processing was selected. The program allocates state premium tax and builds large in-memory arrays. It has a heavy concentration of "if" statements, and it calculates ratios and percentages. Although I/O is important in mainframe processing, all I/O operations were removed in order to create a pure comparison of CPU speed.

As a base, this program was run on an IBM 3090 Model 3090E rated at 15 MIPS per engine, so the program used 64.4 seconds of a 15-MIPS engine to complete.

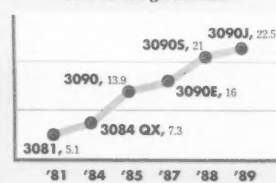
The program's source code was recom-  
*Continued on page 48*

### Vertical takeoff

After lingering around the 1-MIPS level, the performance of PCs has accelerated since 1988, showing a much higher annual growth rate than mainframes



### Mainframe MIPS (per engine)



CW Chart: Doreen St. John

## JUNE 1991

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1
2	3	4 Stamford Salt Lake City, UT Walnut Creek, CA	5	6	7	8
9	10	11 St. Louis San Antonio Honolulu	12	13	14	15
16	17	18 Boston	19	20	21	22
23	24	25 Milwaukee	26	27 Raleigh, NC	28	29

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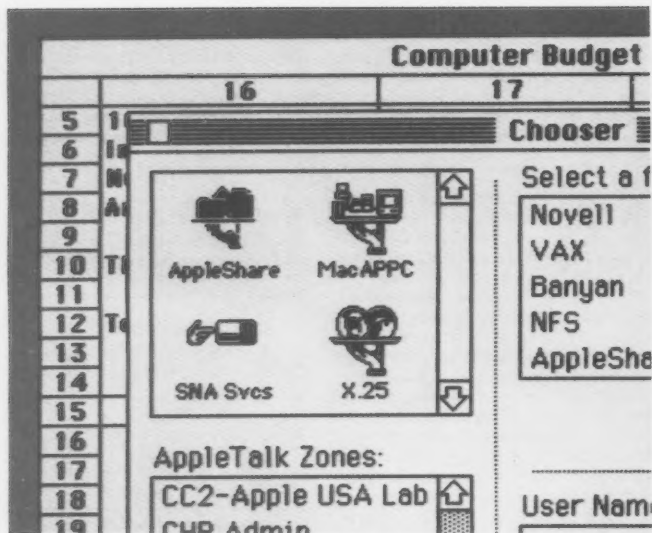
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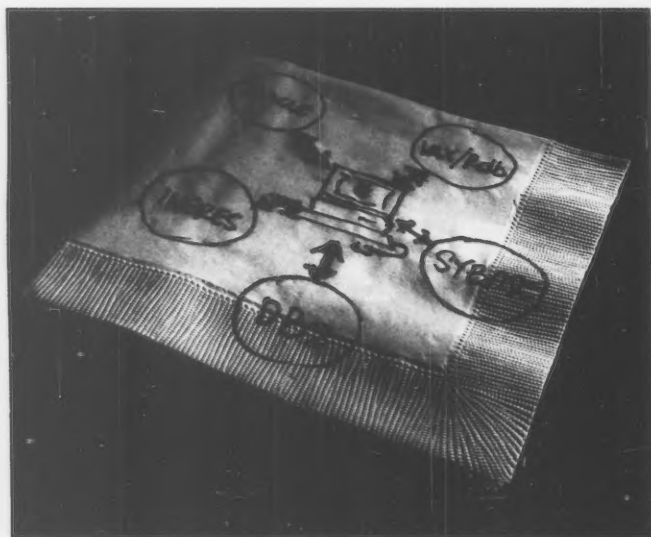
# We're open



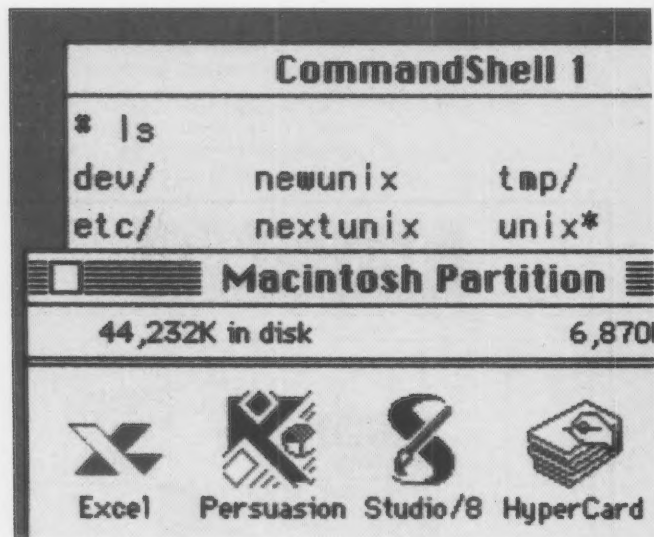
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While diversity may make life rich and fascinating, it makes life as an IS manager something short of serene.

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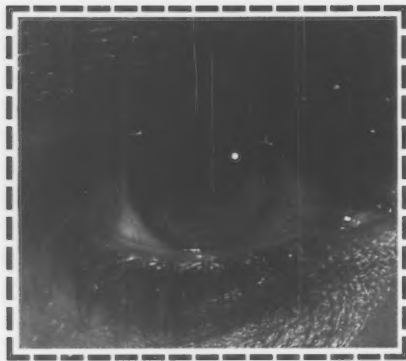
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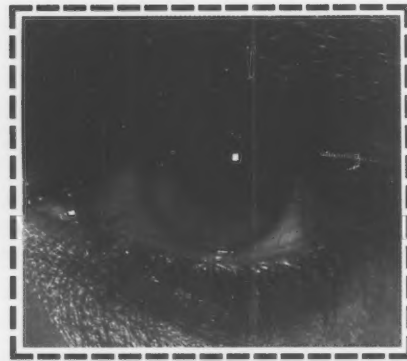


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## Windows' popularity sparks call for trainers

BY JAMES DALY  
CW STAFF

The phenomenal popularity of Microsoft Corp.'s Windows 3.0 has created a burgeoning market for skilled instructors who are familiar with the interface's labyrinthine programming environment and who can tutor developers scrambling to get applications out the door.

Training courses ranging from several days to one week or more blossomed faster than roses in May after developers discovered that building Windows applications was not going to be a cakewalk.

"Programming for Windows has turned out to be much more of a handful than people had originally bargained for," said Howard Sobel, executive director of the National Windows Users Group Network in Media, Pa.

Microsoft's Software Development Kit (SDK), an essential foundation for building Windows applications, was the first route many developers took on their way to crafting their dream application; more than 40,000 copies of the kit have been shipped since last year, Microsoft officials said.

### Much to learn

With more than 500 functions and the number of application programming interface calls hard to remember, the SDK quickly gained a reputation as a daunting and intimidating chunk of technology.

There was also a critical time element involved. Kim Crouse, technical director at Seattle-based training firm Synaptix, said it could take nine to 24 months for a C programmer to become an expert Windows software developer.

By intensifying and focusing the programming instruction, programming teachers said they are able to provide the essential basics of Windows programming in a fraction of that time.

A typical course starts students off with simple source code examples, using the SDK tools to build increasingly complex applications. Trainees are also introduced to the key elements of Windows program development, including the Windows programming model, user interface design and construction, command and data input, presentation of data and memory management.

Many of the instruction firms offer on-site training, allowing developers to avoid travel costs. Fees for a week-long class typically run in the \$1,000 to \$2,000 range, and classes normally contain fewer than 20 students.

Instruction courses are now offered by dozens of firms, including Microsoft's own Microsoft University, Software Entrepreneur's Forum in Palo Alto, Calif., Software Education Corp. in Marlboro, N.J., The Instruction Set in Waltham, Mass., and Logical Operations, Inc. in Rochester, N.Y.

In addition to the classes, developers will still be able to reach for old standbys such as "Programming Windows" by Charles Petzold, a major treatise on building applications.

Microsoft has also recently announced Support Advantage, a multitermed subscription service for developers. In recent months, development environments such as Borland International, Inc.'s C++ Version 2.0 and Parplace Systems, Inc.'s Objectworks/Smalltalk have also hit the market, allowing programmers to bypass the SDK option.



## Insurer puts LAN skills on sale

### ON SITE

BY RICHARD PASTORE  
CW STAFF

NEW YORK — When a company pours years of sweat and blood into a systems overhaul, it should parlay that hard-earned expertise into additional outside income. That is the notion driving Financial Guaranty Insurance Co.'s (FGIC) new consulting services scheme.

FGIC, a municipal bond insurer with \$1.2 billion in assets, was one of the first companies to downsize completely from a mainframe to a personal computer-based network, beginning in 1987. It took the firm 18 months to install Compaq Computer Corp. PCs on a Novell, Inc. Netware 386 Token Ring network, write all new applications using Fox Software, Inc.'s Foxbase and ditch its IBM 4381.

The improvements were marked. Instead of spending about \$6 million per year on a mainframe system that was not adequately serving the growing company, FGIC now has a budget of \$2.5 million. The information systems staff size shrunk from 70 to about 20. Development backlog, once a "generation" behind, has been shortened so that now, "by the time we deliver things, they're still useful," said Andrei Chivvis, first vice president and managing director of systems services.

### Spreading the knowledge

Chivvis figured that other financial firms would be willing to pay for FGIC's help in obtaining such systems benefits. Once director of internal systems, he currently heads the new group, FGIC Systems Services, that intends to market FGIC's downsizing know-how.

"We are one of very few companies with experience of three years working with mission-critical applications" in a strictly PC network environment, Chivvis said. "That experience has a lot of value."

Compaq multiprocessor Systempro with 1.6G bytes of storage run a network of 170 PCs. FGIC has stuck with Compaq over the years because the vendor continues to lead the market, pushing ahead with new technology platforms such as multiprocessing, according to John Geyer, vice president and director of systems.

According to Chivvis.

Today, legal documents that come in from clients and regulatory agencies are scanned into the network via Fujitsu America, Inc. scanners. They are stored in the form of write-once read-many optical discs in a Fujitsu "jukebox."

FGIC deliberately went for a low-cost imaging implementa-



Steve Borns

FGIC's Geyer (left) and Chivvis cut their IS budget by more than 50% after downsizing to a PC-based network

However, Geyer noted that other companies have been catching up with Compaq in advanced products. "The Dells of the world are shipping boxes that look just like the Systempro, so it puts more pressure on them," Geyer said, referring to Dell Computer Corp.

FGIC Systems Services is already working with clients within its parent firm GE Capital Corp. on application downsizing and wide-area networking projects.

Document imaging is another technology area FGIC feels it can leverage for consulting income. The company began evaluating imaging in mid-1989 for the myriad documents it is legally bound to generate and maintain for each insurance policy—some 200 to 400 pages. It took one whole year to implement the system, including converting a backlog of 2 million pages, ac-

tion, working with a budget of less than \$400,000. The firm chose Viewstar Corp.'s Viewstar software because it was designed to run on any network, unlike many other packages that require proprietary hardware and operating systems, Geyer said. It involved little new hardware investment and no decommissioning costs.

The outside consulting practice may eventually require adding another server and several bodies, Chivvis noted. He said he also realizes he is competing with such firms as Andersen Consulting, which possess many more resources.

But Chivvis feels FGIC's strength is its first-person experience and focus. "We're businessmen who understand business needs," he said. The consultancy will focus on the needs of financial firms, he added.

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xdb XDB Systems

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# Wang offers diminutive desktop PC

BY SALLY CUSACK  
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. last week introduced a small, entry-level desktop personal computer that was designed for basic business applications in distributed computing

environments.

Billed as a component of Wang's recently announced Office 2000 strategy, the PC 321/16S system is based on an Intel Corp. 80386SX processor and sports a small-footprint chassis measuring 3.2 inches high.

The 16-MHz machine is available in two configurations. Users may choose a unit with 1M byte of memory, one parallel port, two serial ports, a mouse port, an on-board disk controller, an Integrated Drive Electronics hard disk interface and IBM Video Graphics Array controller, a

1.44M-byte disk drive and a keyboard. The product costs \$1,695.

A similar unit is available without the disk for \$1,595. Both systems are currently shipping.

The system supports up to 8M bytes of memory on the main board and runs on both Ethernet and Token Ring local-area networks.

## I486SX

FROM PAGE 41

base-priced 33-MHz 386 and 33% less than its 25-MHz 80386.

"This is a preemptive strike on our own product line," said Larry Fortmuller, AST's director of high-end systems marketing. "We are out to move people to this technology as fast as possible." Attractive chip pricing and potentially higher vendor margins are the motivations here.

AST predicts that its 486SX system sales will match 386DX sales by year's end. After that, 486SXs will overtake the 386DX, Fortmuller asserted.

PC vendors seem to be taking a wait-and-see attitude before repositioning their 386DX pricing in relation to the new systems. But Intel's expected June release of the 50-MHz 486DX and the ramp-up of 486SX production should send 386 prices spiraling downward 15% to 20% after that.

What will happen to 486DX prices? AST said it will price desktop models more competitively in light of the 486SX. However, 486DX tower systems, because of their relatively high-end configurations and server niches, will be more shielded from pricing pressure, Fortmuller said.

AST's Premium II 486SX/20 ships with 4M bytes of memory, a floppy disk drive and an 80M-byte hard disk for \$3,695. A 210M-byte disk drive and 486DX upgrade boards are options.

### Step rates 13 MIPS

Everex rates its Step 486SX/20 at 13 MIPS (25% faster than the Step 386/33 model) and ships it with 1M byte of memory and a Super VGA adapter. Base pricing ranges from \$3,999 to \$4,599, depending on chassis type. Everex also makes a small-profile Tempo 486SX/20 for \$2,999.

ALR's entries, the Powerflex 486ASX, Businessveisa 486SX, MPS 486ASX and Businessstation 486ASX lines, all feature upgradable CPUs.

They come with the IBM Personal Computer AT-style bus, the Micro Channel Architecture bus or the Extended Industry Standard Architecture bus and 1M byte of standard memory. With an 80M-byte hard disk, prices range from \$2,995 to \$3,995.

Acer's Acerpower 486SX comes standard with 2M bytes of memory, an Ultra-VGA chip set and a floppy disk drive. The upgradable-CPU system runs at 8.5 MIPS on a DOS Power Meter benchmark vs. 13 MIPS for Acer's comparable 33-MHz 486DX system, the company said. A base configuration costs \$2,745.



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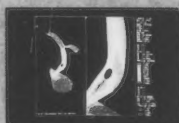
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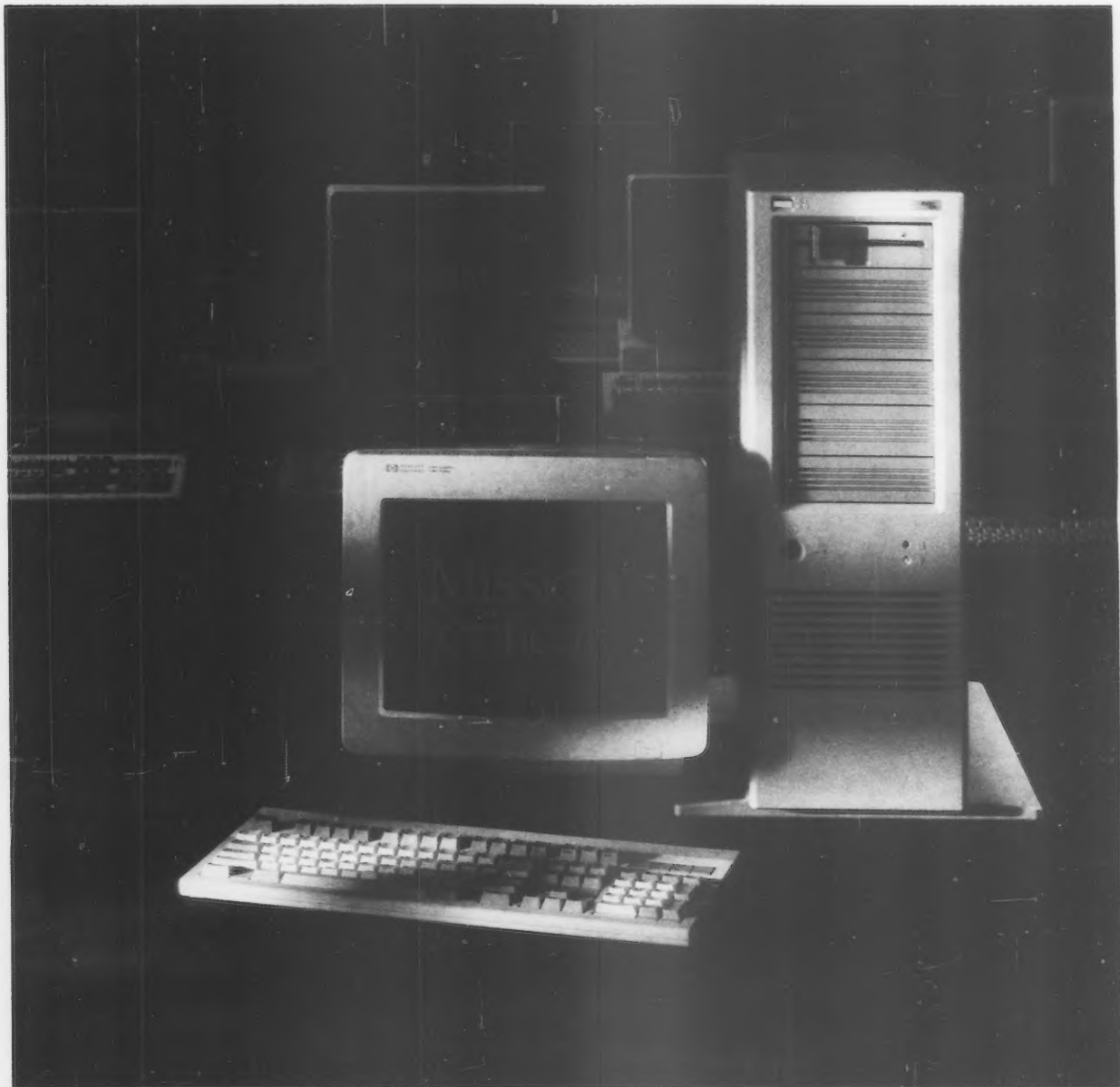


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**HEWLETT  
PACKARD**

## Mainframes

CONTINUED FROM PAGE 41

piled with the Micro Focus compiler and run under MS-DOS on several PCs. The elapsed time for each PC was used to calculate the effective mainframe MIPS rating by multiplying the 3090 time by 15 MIPS and dividing that sum by the PC time.

The Compaq 486/33 took 195 seconds and earned a mainframe MIPS rating of 4.92.

That 4.92 MIPS is considerably lower than the promotional rating of 20 VAX MIPS, but it is still quite impressive. Putting this in perspective, five mainframe MIPS was about the per-engine rating of

the 3081, IBM's top mainframe in 1981. This places PC technology about one decade behind mainframe technology in terms of top-of-the-line power. During the years since, the annual growth rate for mainframe power has been 20%, reaching a per-engine level of 22.5 MIPS for the 3090J family.

### Better PC performance

In about that time, the PC's performance has grown from 0.14 MIPS for the original PC to 4.92 MIPS for the 486/33 processor, which equates to an annual growth rate of 52%.

Before the 486 arrived, the 33-MHz 386 was the fastest PC. The increase in speed when upgrading from a 33-MHz 386 computer to a 25-MHz 486 computer

is only 14%, which is not awesome. Upgrading from a 33-MHz 386 to a 33-MHz 486 generates a 50% improvement in performance, which is more substantial.

In terms of processing power, the difference between a PC and a mainframe is closing fast.

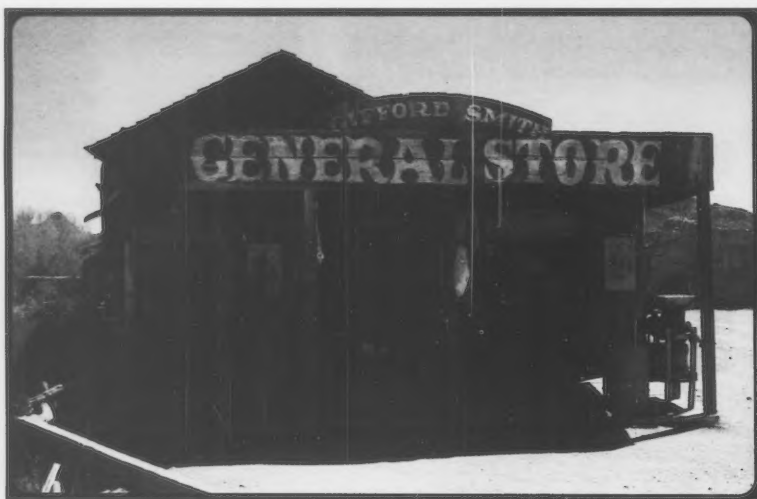
In addition to raw processing power, there are several reasons to run a business application on a mainframe rather than on a PC. Mainframes provide access to large, centralized databases. Mainframes also control large corporate networks that provide national access to applications and data.

There are architectural solutions to these apparent deficiencies in the capabilities of the PC. Client/server processing and cooperative processing could allow

databases and networks to be separated from the program execution and allow programs that run on PCs to access data and networks controlled by other processors.

A key element in capacity planning is the financial cost of performance. This is normally expressed in a price/performance ratio or in cost per MIPS. Having calculated mainframe MIPS ratings for several PCs, it is now possible to compare the cost per MIPS of mainframes and PCs. The cost for the 3090J mainframes is \$110,000 per MIPS. IBM's recently announced System/390 will cost about \$95,000 per MIPS. The cost per MIPS for currently available PCs runs between \$2,000 and \$3,000 per MIPS.

Using the initial availability dates and costs for each computer, price/performance ratios were plotted over time. Here the gap is wide and getting wider. The cost per MIPS on a mainframe has



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**I**N ADDITION TO raw processing power, there are several reasons to run a business application on a mainframe rather than on a PC.

been decreasing at 11% per year, while the cost per MIPS on a PC has been decreasing at 27% per year. Because the cost per MIPS on a mainframe is about 50 times the cost per MIPS on a PC, the relative rates of decrease are inconsequential.

Because the cost of running an application on a PC is approximately 2% of the cost of running it on a mainframe and the power of a 486 is sufficient to run most applications, there is a tremendous incentive to move applications to the PC.

### Cynics answered

Presentations on client/server architectures and cooperative processing talk about off-loading processing from the mainframe. A cynic might ask, "Why would I want to do that?" There are real advantages to having all processing centralized on a single mainframe. It is easier to control, easier to protect, easier to test and easier to change if everything is in one place. It does not make sense to change the processing environment just to do things differently.

The results of these MIPS calibration tests answer the cynics. You can save a lot of money, which will make up for any inconvenience associated with the decentralization of processing.

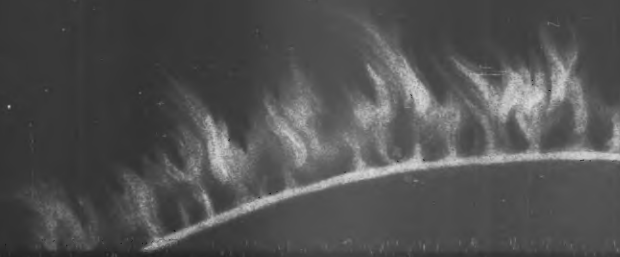
The 50-to-1 efficiency ratio between mainframes and PCs may be overstated because mainframes are much more heavily used than PCs. Mainframe capacity planners like to run their systems at between 80% and 90% utilization.

If utilization consistently falls below 80%, the system is overconfigured and money is being wasted on unneeded resources. If utilization exceeds 90%, there is a risk of degrading performance and jeopardizing service level commitments.

PCs, on the other hand, are lightly used. Most PCs have a utilization rate of 5% or less. Even at these utilization ratios, the PC still has a 3-to-1 price/performance advantage over the mainframe.

*Ames is an information systems professional based in Larchmont, N.Y.*

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# HP's Laserjet IIP: Great price but slow

*Technology Analysis — A roundup of expert opinions about new products. Summaries written by freelance writer Suzanne Weixel.*

**W**ith a small footprint, useful features and Hewlett-Packard Co.'s reputation behind it, the HP Laserjet IIP is about as good as you'll get in a low-cost, single-user laser printer, according to reviewers.

**Output:** The IIP's text and graphics images are clean and crisp. It has no scalable font support, but its automatic font rotation capability is a big plus. It is compatible with Adobe Systems, Inc.'s Postscript and HP's Laserjet Series II printers.

**Performance:** At four page/min with the standard 50-sheet paper tray, the IIP is definitely only a personal printer. It is expandable, with multiple tray options and up to 4.5M bytes of random-access memory, but reviewers do not recommend it if speed is crucial.

**Ease of use:** The one-piece drum toner replacement slides in. The printer has a two-line LCD on the front panel.

**Service and support:** The IIP's modular design is ideal for servicing.

**Value:** As a desktop personal laser, the IIP is tops, reviewers said. It lists for \$1,295; the 250-sheet lower cassette paper tray costs \$195.

## Hewlett-Packard Co. Laserjet IIP

Reviews	Output	Performance	Ease of use	Service & support	Value	Score
<i>Infoworld</i> 10/8/90	Excellent	Satisfactory	Good	Excellent	Excellent	7.9
<i>PC Magazine</i> 6/12/90	Good with more fonts	One of the slowest	A breeze	NC	NC	Editor's choice
<i>PC World</i> 2/91	Good	Fair	Excellent	Superb	Excellent	Best buy
Users						
<b>John Fortier,</b> New York Life Insurance Co.	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	Unreliable
<b>Sudie Carver,</b> Intelco Aluminum Corp.	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	Worth the money
<b>Kevin Gilmartin,</b> The Chase Manhattan Bank NA	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	Unreliable
Analysts						
<b>Robert Fennell,</b> Dataquest, Inc.	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	Good quality
<b>Angele Boyd,</b> International Data Corp.	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	Excellent
<b>Marc Boer,</b> BIS Strategic Decisions	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	Reliable

Key: ■ ■ ■ ■ Very good ■ ■ ■ Good ■ ■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment

### Vendor financial ratings

Analysts	Long-term stability	Short-term performance
<b>Wendy Abramowitz,</b> Argus Research Corp.	■ ■ ■ ■	■ ■ ■ ■
<b>Tim McCollum,</b> Dean Witter Reynolds, Inc.	■ ■ ■ ■	■ ■ ■ ■

Hewlett-Packard Co. reported net income of \$771 million for 1990, 4.7% less than in 1989. The company's first-quarter net income was \$205 million, compared with \$173 million in the first quarter of 1990.

### Hewlett-Packard responds

*David Ritchie, market development engineer:*

**Output:** Concerning scalable fonts, automatic font rotation doubles the number of fonts.

**Performance:** If you are used to eight page/min, it may seem slow, but most customers are used to dot matrix.

**Value:** The IIP is an entry-level HP Laserjet at the best price possible.

# IBM Laserprinter E: Faster and room to grow

## IBM Laserprinter E

Reviews	Output	Performance	Ease of use	Service & support	Value	Score
<i>Infoworld</i> 10/8/90	Very good	Very good	Very good	Good	Very good	7.0
<i>PC Magazine</i> 6/12/90	Good	Top speed	Good	NC	Excellent buy	Versatile
<i>PC World</i> 2/91	Good	Good	Fair	Dealer only	Good	Powerful, well-built
Users						
<b>L. Robert Bowe,</b> Computer Techniques, Inc.	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	NC	■ ■ ■ ■	Excellent price/performance
<b>Jane Redfern,</b> Bellare Computer Center	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	NC	■ ■ ■ ■	Quiet, reliable
<b>Connie Turner,</b> Antrim County, Mich.	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	Good but a bit slow
Analysts						
<b>Robert Fennell,</b> Dataquest, Inc.	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	Reliable
<b>Angele Boyd,</b> International Data Corp.	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	Upgradable
<b>Marc Boer,</b> BIS Strategic Decisions	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	Versatile

Key: ■ ■ ■ ■ Very good ■ ■ ■ Good ■ ■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment

### Vendor financial ratings

Analysts	Long-term stability	Short-term performance
<b>Craig Kraff,</b> Edward T. Jones & Co.	■ ■ ■ ■	■ ■ ■ ■
<b>Wendy Abramowitz,</b> Argus Research Corp.	■ ■ ■ ■	■ ■ ■ ■

IBM posted first quarterly loss in its history: \$1.7 billion for the first quarter of 1991, which included an unusually large restructuring charge. But for 1990, IBM earned net income of \$6 billion, a 60% increase.

### IBM responds

*Mike Reiter, senior communications specialist:*

**Output:** Infinite font rotation is available through the purchase of the Postscript option.

**Ease of use:** We have had few negative comments on the control panel. We have had numerous positive comments on ease of using other features.

**Service and support:** Instructions for accessing a direct support line are included in each shipment.

**I**BM's Laserprinter E is slightly larger and faster than other personal lasers, and according to reviewers, its upgrade path can't be beat.

**Output:** Text and graphics are sharp. Plotter emulation is standard, and although the standard fonts are nothing special, the font options, including an Adobe Systems, Inc. Postscript add-in board, are. Two drawbacks: The two-font slots accept only IBM cards, and there is no automatic font rotation.

**Performance:** The Laserprinter E clocks in at five page/min — faster than its leading competitors. It has three memory upgrade options for a total of 4M bytes. The printer's 12,000 page per month duty cycle is also worth noting, but the biggest plus, reviewers said, is that you can turn it into a 10 page/min Laserprinter 4019 with a \$1,099 controller card.

**Ease of use:** The single toner cartridge is simple to change. The rear feeding paper tray is somewhat awkward to reach, and using the front control panel, which has no LCD, can be confusing. *PC World* suggested keeping the manual close at hand.

**Service and support:** IBM's dealer-only support policy is a drawback.

**Value:** According to reviewers, the Laserprinter E is priced right for a desktop, and it can grow into a network. It lists for \$1,495.

NEW PRODUCTS

Software utilities

HG Translator, a graphics translation utility from Microsoft Corp., is currently available. The program converts Software Publishing Corp.'s Harvard Graphics files into Microsoft's Powerpoint presentation soft-

ware format. HG Translator will be shipped with the current version of Powerpoint. Previously registered users of Powerpoint may purchase the utility for \$7.50. **Microsoft One Microsoft Way Redmond, Wash. 98052 (206) 882-8080**

Quicksoft, Inc. has begun shipping Wordperfect Filter, a file conversion software product. The program converts Quicksoft's PC-Write word processor files to Wordperfect Corp.'s Wordperfect format and vice versa. The company said translating files between the two formats requires only a few seconds. The filter costs \$19.

Quicksoft 219 First Ave. N., No. 224 Seattle, Wash. 98109 (206) 282-0452

Symantec Corp. has announced The Norton Backup for Windows, a utilities program that is capable of performing unattended, scheduled file backups. The product can run concurrently with other Microsoft

Corp. Windows 3.0 programs and can back up networks as well as stand-alone personal computers. It can be manually activated with two keystrokes, according to the vendor. The price is \$149. **Symantec 10201 Torre Ave. Cupertino, Calif. 95014 (408) 253-4092**



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Software applications packages

Triumph and Triumph/Des, a pair of DOS-based security software programs from Micronyx, Inc., are now able to support up to 32 loggable users on a single common-area personal computer. Triumph protects data by encrypting each file rather than by limiting drive access. Up to 256 users can be listed for access to a given file. In a network, each computer requires a copy of Triumph in order to decode encrypted files. The \$195 product includes a guest user option that provides definable restricted use of a PC to visitors. **Micronyx 1901 N. Central Expwy. Richardson, Texas 75080 (214) 690-0595**

Macintosh products

Ares Software Corp. has introduced Fontmonger, an Apple Computer, Inc. Macintosh type conversion and alteration software package. The product switches type format among three major fonts: Adobe Postscript Type 1 and Type 3 and Apple Truetype. Fontmonger also permits users to alter height and width proportions as well as slants of existing typefaces. Footmonger costs \$99.95. **Ares Software Suite D 561 Pilgrim Drive Foster City, Calif. 94404 (415) 578-9090**

Development tools

Lucid, Inc. has introduced Lucid C, an ANSI-standard C language compiler designed for Scalable Processor Architecture-based workstations. The compiler is fully compatible with Sun Microsystems, Inc. tools and libraries, according to Lucid. It employs a number of optimization techniques, including global register allocation, instruction scheduling and partial and total redundancy elimination. Lucid C costs \$495. **Lucid 707 Laurel St. Menlo Park, Calif. 94025 (415) 329-8400**





# NETWORKING

BIT BLAST

## GTE to use UB gear

Ungermann-Bass, Inc. reseller GTE Telephone Operations has reportedly decided to install a multimillion-dollar, 4,000-node network of UB's intelligent wiring concentrators in its Irving, Texas, headquarters. Fifty-six of the vendor's Access/One concentrators will link 10Base-T Ethernet networks over a fiber Ethernet backbone and will be managed by UB's Netdirector network management system.

Router vendor Wellfleet Communications, Inc. and T1/T3 company Digital Link Corp. have said that the second half of the year will see general availability of a Switched Multimegabit Data Service (SMDS) interface that links Wellfleet routers and Digital Link digital service units/channel service units. SMDS is an emerging switched digital service that transports data at speeds ranging from 1.5M bit/sec. (T1) to 45M bit/sec. (T3).

Products from inter-networking vendor Cisco Systems, Inc. are reportedly now listed on the federal government's General Services Administration schedule. The listing is said to permit government organizations to purchase Cisco routers, router/bridges, terminal servers and network management software at 20% off of Cisco's list prices.

AT&T Easylink Services recently opened a computer processing center in Ontario to handle the electronic mail traffic in Canada. Previously, Canadian Easylink customers had to access a messaging hub in the U.S. In addition to Canada and the U.S., the E-mail provider, based in Basking Ridge, N.J., has processing centers in the UK and Japan and plans to open more centers later this year.

## Novell plans 1,000 sessions

BY JIM NASH  
CW STAFF

Almost one year after Novell, Inc. said it would deliver a server capable of holding 1,000 concurrent IBM host sessions, only the first shadows of the product are appearing.

In announcing its Communication Services application programming interface last June, the Provo, Utah-based networking company said it would build such a capability into its high-end Netware Version 3 network operating system.

Gerry Machi, director of marketing for Novell's communications products, said Netware Services for Systems Application Architecture (SAA) will ship this month with the capacity for 64 concurrent host sessions. It will be Novell's first SAA product.

### Impressive results

Two resellers who attended Netware for SAA classes last week said they were impressed with the demonstration of the product, although connections were made only to a simulated host.

Novell already markets a Systems Network Architecture (SNA) gateway able to hold 128 concurrent sessions, although some users report that getting 128 sessions to run concurrently and efficiently is difficult.

Unlike that product, Netware for SAA will be a Netware Loadable Module based on 32-bit architecture, according to Paul Spessart, vice president of integration support at Computer Support of North America, a reseller in Basking Ridge, N.J. Being an application that can use twice the address space, Spessart explained, the new package should outperform the SNA gateway.

Included with the product will be a runtime version of Netware v3.11, he said. The runtime software is basically a one-user implementation of v3.11's file-server functions capable of supporting Communication Services and related Netware applications. Using it saves managers from buying a full-blown Netware v3.11 package just to disperse numerous applications over multiple servers.

It was unclear whether Novell will include a status screen with Netware for SAA, said Bob Koons, director of integration

services at Inacomp Computer Centers of Georgia in Atlanta. The screen would show all logical units at once, noting which ones were connected as well as which workstations were connected and other facts. Koons said Novell told the class the feature may not make the application's debut this month.

### In the future?

Machi said another version of the module — one able to hold 254 concurrent host sessions — is in the works, but he declined to say when it would be delivered.

Similarly, he would not comment on when Novell would finish testing multiple SAA modules on a single server. Adding duplicate modules, Novell has said, should result in a maximum of 1,000 concurrent sessions.

Some industry consultants and users said they have seen 1,000-session servers running at beta-test sites. Machi said Novell is working toward a module that holds more than 254 concurrent sessions but refused to elaborate.

One former information systems manager who requested anonymity said he is aware of as many as 10 sites currently running 1,000-session Netware servers.

## NYC agency uses FDDI to cut costs

BY JOANIE M. WEXLER  
CW STAFF

NEW YORK — Networking buzzwords abound at the New York City Department of Environmental Protection.

The agency is immersed in a \$4 million project to install technology such as Fiber Distributed Data Interface (FDDI), 10Base-T and smart wiring hubs in order to save \$2 million in annual operating costs and respond more quickly to public health and safety issues.

In an all-out reorganization of its computing environment, the department is consolidating 15 previously independent terminal-to-mainframe-based sites into two adjacent buildings with local-area networks on multiple

floors. While the organization has the luxury of implementing a whole new cabling and networking scheme from the ground up, the project has presented a steep learning curve. It is the informa-

tion services staff's first brush with distributed computing, director of communications Rande Morgan said.

Easing the revamp has been the ability of the department's longtime T1 multiplexer vendor, Timeplex, Inc., to step in with present-day technology, Morgan said. Timeplex is supplying the initial seven Ethernet-to-FDDI routers that will attach 10Base-T LANs on various floors to an FDDI backbone. Having a history with Timeplex has facilitated bringing the project together, Morgan said.

FDDI is a fiber-based 100M bit/sec. Token Ring LAN whose primary application today is to link slower speed LANs. Morgan had the foresight one



New York is installing FDDI technology to better address the city's environmental issues

To page 58

## Fibronics ties together mainframes, 'X' nets

BY JOANIE M. WEXLER  
CW STAFF

Like a Gorbachev and Reagan handshake, relations between SNA and TCP/IP computing environments are warming. A recent sign was Fibronics International, Inc.'s introduction of X Window System software that ties IBM mainframes to Unix-oriented networks.

The X Window system — often called "X" — is a public-domain windowing protocol that is operating system- and architecture-independent. When installed on a computer or intelligent X terminal as "server" software, it allows users to access applications residing on other computers on the network that are equipped with X "client" software.

X has traditionally run in Unix environments. Unix applications tend to "speak" Transmission Control Protocol/Internet Protocol (TCP/IP), not the Systems Network Architecture (SNA) protocols that run on IBM mainframes.

Fibronics' X client offering for IBM's VM and MVS mainframe operating systems brings together the two environments. In the X world, applications developers write code to standard X displays so they do not have to customize programs for different display devices. This allows a computer running X "server" software to display applications

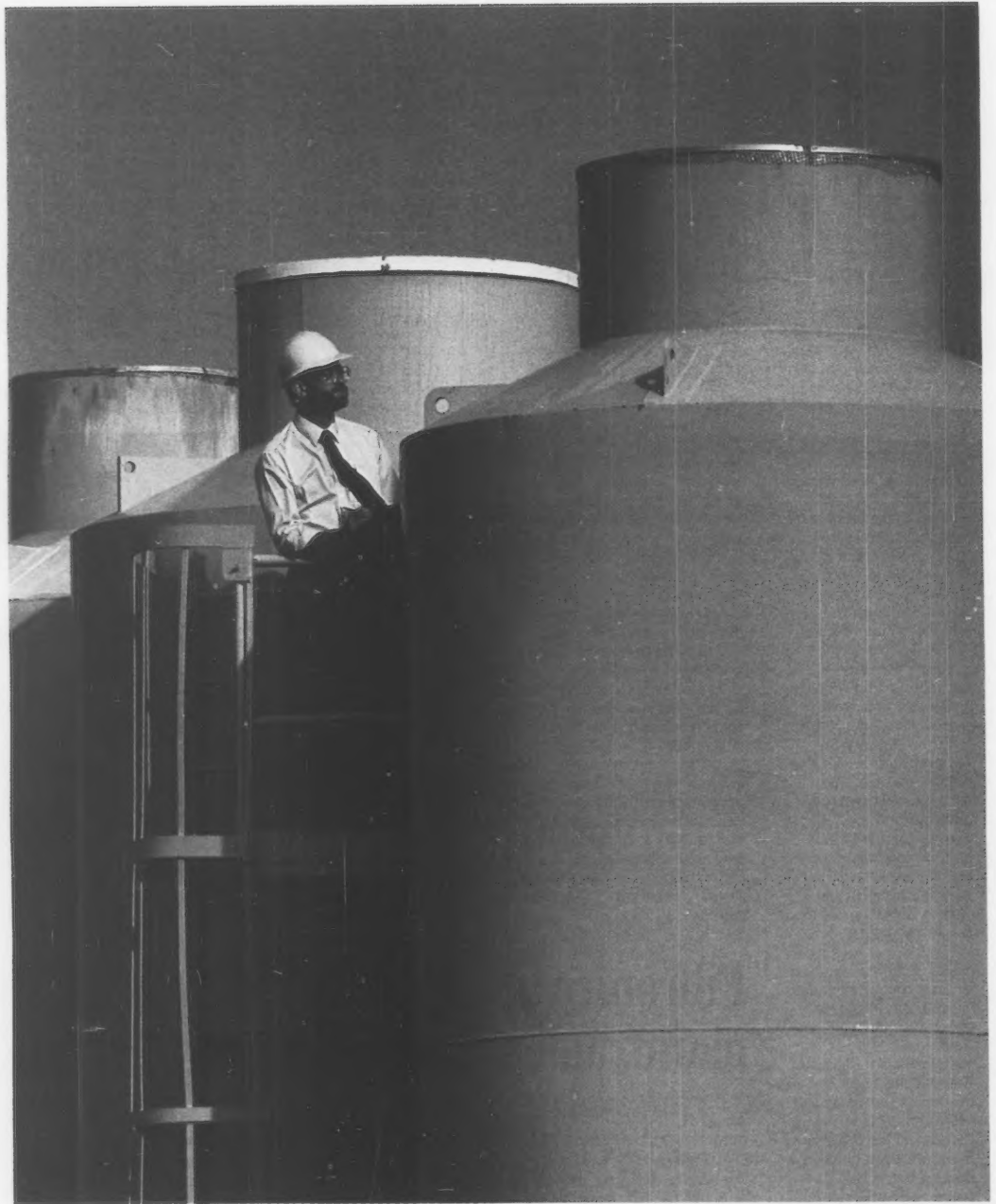
from multiple, incompatible hardware platforms.

Fibronics is introducing some healthy competition for today's sole provider of X for mainframes: IBM. IBM released TCP/IP software with X Window support for its VM- and MVS-based mainframes last September, although "in the X world, not a lot of people know these products exist," commented Stephen Auditore, president of X Business Group, Inc. in Fremont, Calif.

TCP/IP and X access to mainframes "is a relatively new trick," agreed Neville Per-

Continued on page 54

# NETWARE SOLVES ISSUES AT



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But open connectivity is only one consideration. After all, the EPA can't afford to test the waters with an unreliable network. So they use the only PC-based network operating system that's in its eighth generation. According to Stoneman, "We use NetWare for its reliability, advanced capabilities and functionality. It's easy to maintain, and we are very pleased with the security that NetWare provides."

In addition to sharing information and accessing several host systems, the EPA tracks cleanup efforts and communicates through E-mail over its NetWare network. All of which make for a very productive office environment. In fact, Stoneman attributes some significant cost savings to NetWare, "We no longer need a laser printer on every desk or 12,000 copies of dBase, Lotus and WordPerfect."

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The Past, Present, and Future  
of Network Computing.

# Three firms opt for AT&T Tariff 12

BY ELLIS BOOKER  
CW STAFF

AT&T recently announced a trio of three-year integrated voice and data network contracts with customers.

The Tariff 12 contracts, totaling more than \$89 million, were all with existing AT&T customers.

The largest deal, for \$42 million, calls for AT&T to provide The Travelers, an insurance company in Hartford, Conn., with a digital communications network for 300 of its remote offices. According to Trav Waltrip, vice president of telecommunications at The Travelers, the benefits will be twofold. First, the company will purchase services in a package from AT&T

rather than a piecemeal approach. Second, Waltrip said, Travelers will receive a machine-readable common bill rather than hundreds of paper bills.

Airborne Express awarded AT&T a contract to design and run a customized voice and data network connecting its 240 loca-

tions nationwide.

Airborne had previously used AT&T's Software Defined Network and its Spectrum Digital Services for voice and data, respectively, and looks forward to cost savings and the convenience of a consolidated bill, according to Charles Franz, man-

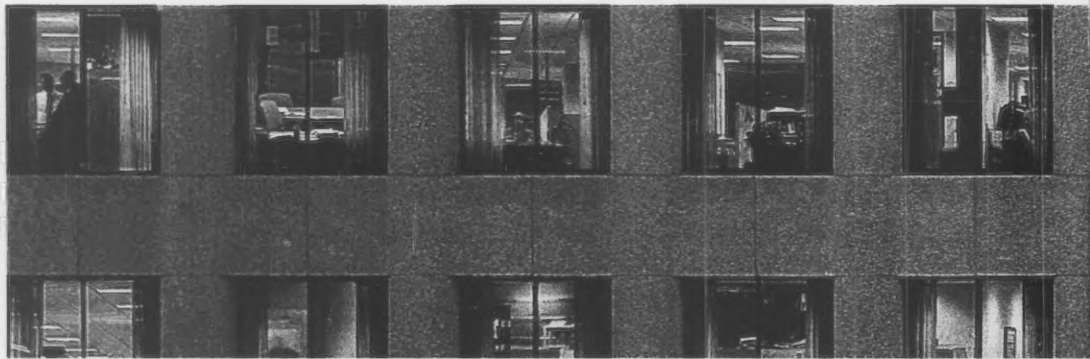
ager of voice communications.

Franz said his company, which recently upgraded its digital facilities from 9.6K bit/sec. to clear 64K bit/sec. lines, will continue to use a centralized data processing architecture, with the remote offices connected to the company's multiple mainframes in Seattle.

As in the past, AT&T will staff the network management

center supporting the Airborne network.

Finally, AT&T expanded its work with Hartford, Conn.-based Aetna Life and Casualty Co., renegotiating a prior \$30 million contract for the insurance company's worldwide customized voice and data network. The \$35 million deal brings the number of field offices served to 300.



## Fibronics

FROM PAGE 51

eira, supervisor of utility company Ontario Hydro Research Division's integrated computing environment in Toronto. Pereira said Fibronics' X offering could cause him to reevaluate implementing IBM's TCP/IP on his mainframes.

Pereira is disappointed that Fibronics' X for mainframes — Knet X Windows — requires Fibronics' Knet TCP/IP to run alongside it. He would be willing to mix and match vendors, he said, but will probably go with IBM for both functions because "we're using a Network Systems, Inc. gateway that I don't believe Knet supports."

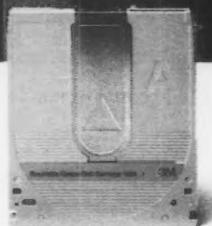
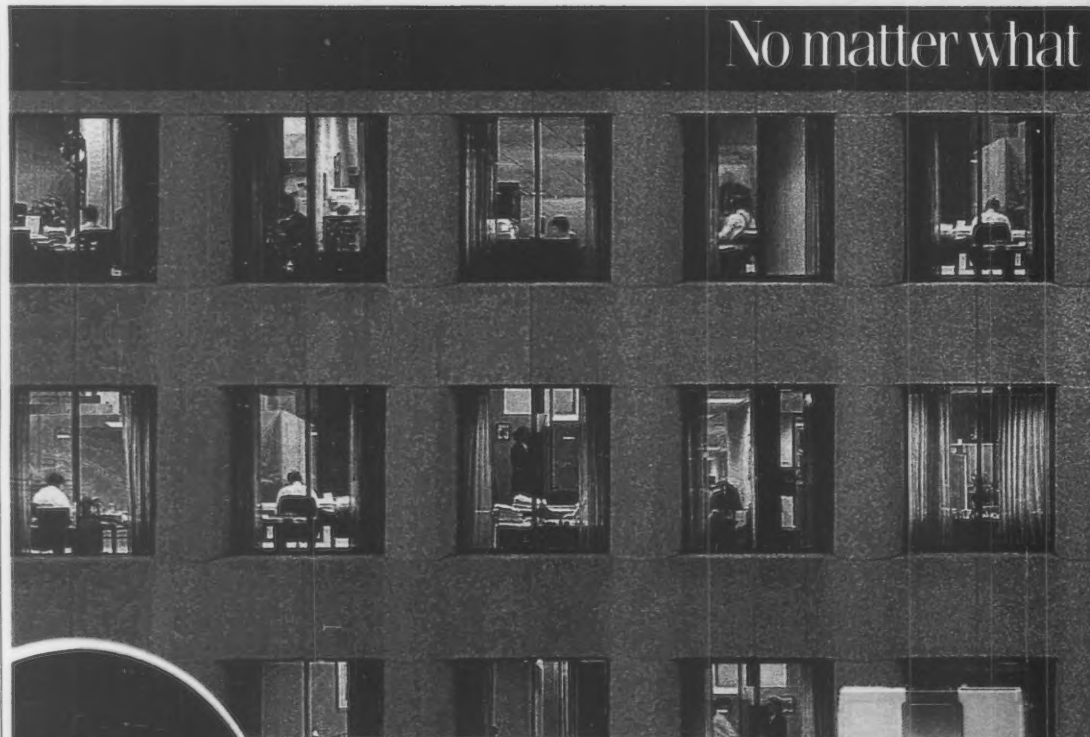
Ontario Hydro already uses Fibronics' Fiber Distributed Data Interface local-area networking equipment. The utility company operates a plethora of disparate hardware and software platforms, including about 10 Network Computing Devices, Inc. X terminals.

Pereira said he is finding that "so many functions — such as database and transaction services — are delivered by the 'big iron' that, increasingly, you need access to these business tools no matter what facet of work you're involved in."

Paul Cabbage, associate director of Unix systems software service at Dataquest, Inc., added, "Many mainframes are starting to be used as big file servers. As more and more workstations — which are generally Unix-based — show up on the desktop, you're likely to see an increased need for X-based connectivity to the mainframe."

Knet X Windows for VM costs \$4,000 to \$6,000. For MVS, it costs \$6,500 to \$8,500. The product runs alongside Fibronics Knet TCP/IP and supports the Open Software Foundation's Motif interface.

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# Cellular makes room for data

BY JIM NASH  
CW STAFF

Even in the most congested cellular telephone markets, room exists for data transmissions between calls. Engineers at two cellular phone companies are

testing a scheme to shoehorn data channels between existing voice channels.

If the technical and marketing tests are successful, one industry analyst said, telephone companies could open the door on an estimated \$2 billion worth of

new data transmission services. A start-up called Cellular Data, Inc. in Palo Alto, Calif., is pushing what it calls the cellular packet data network.

Cellular Data foresees messages from several sources being handed off from one cell site to

another across the continent. Miklos Korodi, president of Cellular Data, said the most apparent use is replacing leased and dedicated lines in credit-card authorizations and purchases. Other uses include alphanumeric messaging, burglar alarms and environmental telemetry.

Korodi said it may even be possible to install radio devices in portable automated teller ma-

chines that could be carted into sporting events or disaster scenes.

While only nominally a network now, the service is an affordable way to take short bursts of data, such as data involved in credit-card transactions, and pass it between voice channels, Korodi said.

Ron Grawert, vice president of technology at Houston-based GTE Telecommunication Products and Services, a division of GTE Corp., said GTE has installed Cellular Data network devices at six cell sites in the city for a three-stage test. The first phase — seeing whether data transmissions interfered with voice communications — was a success, he said.

The second phase will see whether voice interferes with data transmissions, and the third, ongoing part of the test will examine commercial viability. Similar tests are being conducted by Bell Atlantic Mobile Systems, a Bedminster, N.J., cellular company that has invested \$1 million in Cellular Data.

## An interesting market

GTE began working with Cellular Data 18 months ago. "We're committed to testing only," Grawert said, but "we see a pretty interesting market for wireless communications."

As part of the tests, businesses in various locations in Houston and Philadelphia have been given transceivers, or packet radios, that Korodi said should sell for \$150 each.

Debit and credit cards from participating local banks are run through the device. Digital data is handed off in the 824- to 896-MHz band from cell site to cell site via Cellular Data equipment at each station.

Prices for the packet radios will probably fall to \$50, according to Steve Sazegari, an analyst at Dataquest, Inc. in San Jose, Calif. Sazegari said he thinks the potential market for service and equipment could be \$2 billion in the next five to seven years.

Transmission rates were currently at 2,400 bit/sec.

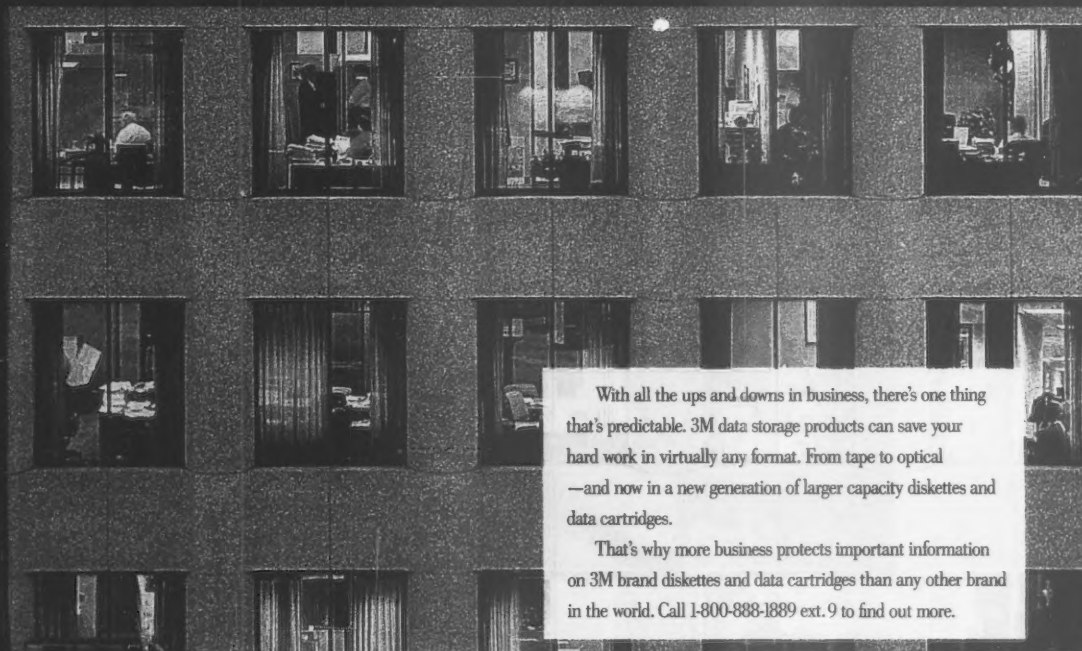
Cellular Data has received a patent for the process of using what is called cellular sideband, and the Federal Communications Commission has given the company its blessing.

"We are fairly happy to see this kind of activity," said Tom Stanley, an FCC chief engineer. "In the late 1980s, the government relaxed regulations on existing cellular rules to encourage alternative services." He said he was unaware of any comparable service.

GTE expects to wrap up its tests by the end of June. Bell Atlantic, which has 220,000 potential customers, plans to make a decision on whether to adopt the technology this fall, said Tim White, director of business development at the company.



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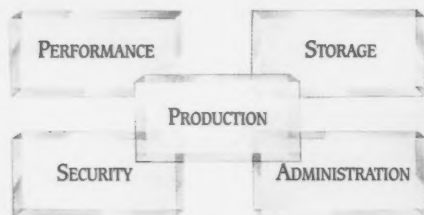
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## NYC agency

FROM PAGE 51

year ago to install fiber, despite a user survey at the time that indicated "no one had any interest in LANs," he said. "We put in the fiber just in case; now, suddenly, everyone has decided they need LANs" that must interconnect.

For example, one wastewater

treatment application involves a computer room on one building's sixth floor and 250 users on the second floor. "I wasn't going to run 250 wires between floors,"

Morgan said; thus, the FDDI backbone. A Prime Computer, Inc. 6350 host on the sixth floor attaches to a Timeplex router to the FDDI backbone in the elevator shaft to the second floor. From there, the traffic travels

onto another router on that floor into a hub and off the hub into the appropriate 10Base-T LAN.

10Base-T is a 1-year-old standard for running 10M bit/sec. Ethernet LAN traffic over unshielded twisted-pair wiring in a star topology through a smart wiring hub. Each of the department's floors will eventually have a 10Base-T LAN running Novell, Inc.'s Netware network

operating system.

In addition, the agency has standardized on Cabletron Systems, Inc. and Hewlett-Packard Co. hubs and plans to implement Cabletron's Spectrum or HP's Openview enterprise-wide network management systems.

The \$2.5 million cabling chunk of the project was handled by NEC America, Inc., whose price included a NEC digital pri-

ivate branch exchange. NEC ran unshielded twisted-pair wiring to 3,000 work areas on 16 floors of two buildings in LeFrak City, a section of New York's borough of Queens. Each work area houses a voice jack and two data jacks.

A wiring closet holds the entire agency's communications equipment, including controllers, routers, hubs and modems; the hubs bridge over wide-area communications links to the agency's two redundant data centers in downtown New York.

**W**E PUT IN the fiber just in case; now, suddenly, everyone has decided they need LANs" that must interconnect.

LANE MORGAN  
NEW YORK DEPARTMENT  
OF ENVIRONMENTAL  
PROTECTION

Previously, each of the 15 locations hooked through a Timeplex T1 multiplexer into a local hub center, where data was concentrated onto a 56K bit/sec. line to Citynet, a citywide network that taps into all the major city government mainframe sites.

With the new network, the environmental protection department will retain access to Citynet via a single hub in the LeFrak communications closet — instead of through 15 hubs.



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PC Magazine, 12-11-90 (Ziff Davis Publishing) "9600-BPS MODEMS: Breaking the Speed Barrier PC LAN Labs tests seven rapid-fire modems complying with V.32, V.42 and V.42bis standards."

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## Racking up some net gains

The New York Department of Environmental Protection's new network aims for the following:

- A \$2 million annual savings in operating costs.
- Faster financial approval for urgent projects, such as fixing broken water mains or asbestos-related repairs.
- Fulfillment of federal legislation to obtain, maintain and disseminate information on hazardous materials.
- FDDI's 100M bit/sec. backbone speeds for networking advantages, such as computer-aided design (CAD) engineers in one building accessing a CAD host in another.

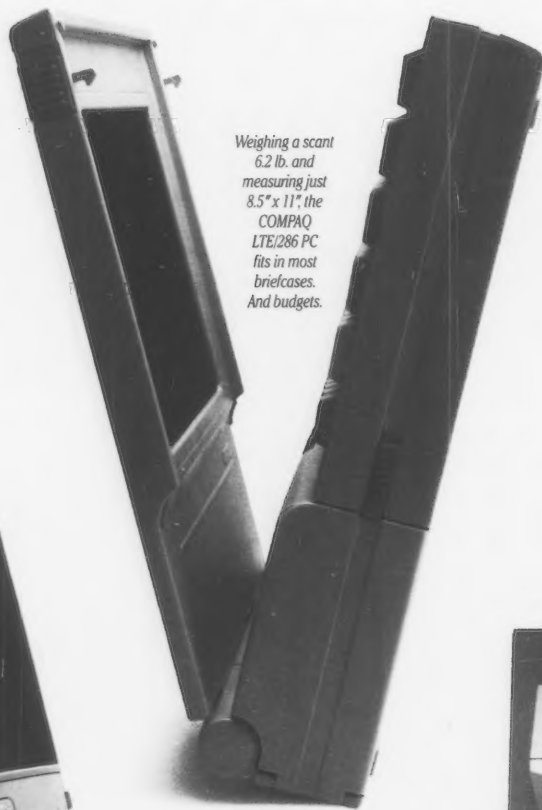


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# LAN benefits Chicago treasury

Switch to information technology makes \$3.1 billion budget manageable

**ON SITE**

BY MICHAEL FITZGERALD  
CW STAFF

CHICAGO — From the book *1,000 Reasons To Take The Day Off*, reason No. 32: "Your company makes you manage its \$40 billion cash flow using only a manual ledger system."

The only catch is, your employer is the city of Chicago, and for you, City Treasurer Miriam Santos, it would not be politically expedient to take the day off. Your answer: a local-area network and some high-powered financial management software.

"The system is working well, and even though the conversion is on-going, the availability of better information is already saving staff members several hours per day," said Santos, who is not on the network yet but is using a Toshiba Corp. T3100 portable computer on a dial-up basis.

In hard benefits, Santos said, the network immediately reduced banking fees, greatly improved returns on short-term in-

vestments and added investment flexibility.

Most of the treasury's processing is done on an IBM mainframe, but the department decided that cash accounting and investment management required more flexibility and chose a LAN. "We felt MIS didn't have the expertise we wanted or the sensitivities to our needs coming from a mainframe environment," said Carlton R. McGee, first deputy city treasurer.

Treasury staff members credit Santos with the political savvy and determination to get the city's purchasing committee to approve a \$300,000 budget for installing a LAN and acquiring software to run the city's \$3.1 billion annual budget.

"A bureaucracy as it exists in almost any government entity is difficult to change," Santos said. "You have to be very tenacious about change.

The difficulty was in communicating why it was important to change and why we had to make the changes."

The basic reason for the switch was the existing accounting methods, which dated back to the Industrial Revolution.



Steven Green

Chicago's Santos was key to installing a LAN to manage the city's \$3.1 billion budget

In place today is a 16-node Ethernet network running Novell, Inc. Netware and based on a 33-MHz 386 server from Chicago-based Systems Integration Associates, with 10 Systems Integration 386-based machines and six other personal computers. The treasury uses Boston-based Thomson Financial Networks Co.'s Portia system to track its portfolio.

The treasury is adding other sophisticated software, including a package based on Bloomberg L.P.'s Blomberg system. Blomberg is a New York-based maker of financial network reporting systems that tracks market fluctuations for investment purposes.

"We're just trying to catch up to the rest of the world," said John S. Henry, deputy city treasurer of accounting. Being so far behind the automation curve has some payoffs, he added. With no system in place, the treasury was able to select sophisticated software that would allow it to expand in the future. At the same time, buying for more than current needs has provoked challenges.

"The question that came back to me is, 'Why do you want something so powerful?'" Henry said. "I don't want something that's going to be obsolete a year from now. The system is not going to leave, and we wanted to buy something that had a lot of power to it in case we ever got the authority to venture off into different financial avenues."

**Sudden impact**

Bringing the treasury into the Information Age has a huge potential impact: Besides the city's budget, the city treasurer is also treasurer of the Chicago Board of Education, invests all the city's bond proceeds, manages escrow funds and is a trustee for \$2 billion worth of city employee pension funds and the Chicago Public Schools teachers' pension fund. It all adds up to a \$40 billion annual cash flow.

"For me, having good, solid information means, for instance, that I know I have exactly \$87 million to invest today, so I can get bulk rate prices and [use this to] compare rates," Santos said.

The treasury has even received an unexpected benefit from new technology use: In October, a check-kiting scam was uncovered thanks to a check microfilming process implemented along with the network.

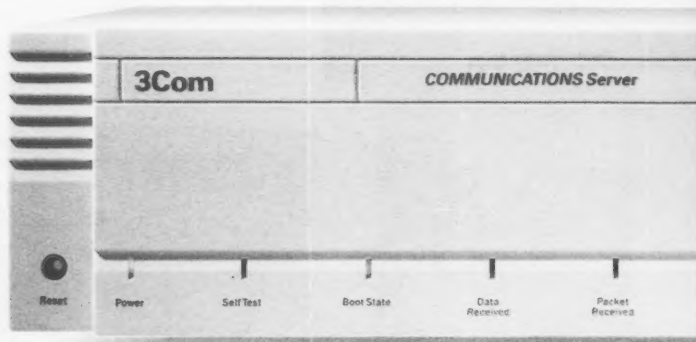
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Legato Networker 2.0, a network backup and recovery software package announced by Legato Systems, Inc., includes a new X Window System graphical user interface.

The upgrade also adds security options and increases user control over backup scheduling. Backup performance is raised to about 180K to 200K byte/sec., the company said.

Version 2.0 is available for Sun Microsystems, Inc. and Solbourne Computer, Inc. platforms, and it costs \$4,995. An entry-level product, which can back up a maximum of four networked systems, costs \$2,500.

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**Micro-to-micro**

Sofnet, Inc. has updated its unattended file transfer program to include fax transmission facilities.

Xchange Plus 7.0 can be set to relay information to remote

personal computers or fax machines on a one-time or regular basis. It offers automatic data compression and encryption options for transferring files across dial-up networks. Other functionalities included are terminal emulation and electronic messaging.

A package with two copies costs \$345.

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**Local-area networking hardware**

Intellicom, Inc. has introduced three Ethernet-to-10Base-T networking products.

The Tpair-312 Wiring Concentrator has 12 unshielded twisted-pair wire ports, each with full repeater/retiming capability. Pricing ranges from \$999 for a basic hub to \$1,777 for a model with an integrated Simple Network Management Protocol agent.

The Tpair-PNA Portable Network Adapter connects any portable personal computer to an unshielded twisted-pair net-

work wiring hub.

The product (\$399) includes drivers for network operating systems from Novell, Inc., Microsoft Corp. and Banyan Systems, Inc.

The Tpair-401P Pocket Transceiver provides an interface between a coaxial 15-pin network card and any 10Base-T concentrator. The transceiver weighs 2.5 oz. and lists at \$129.

**Intellicom**  
20415 Nordhoff St.  
Chatsworth, Calif. 91311  
(818) 407-3900

Data General Corp. has announced Novell, Inc. Netware v3.11 packaged servers for its Dasher personal computers.

Pricing begins at \$10,995 for an Intel Corp. 80386-based PC with a 20-user license. A high-end, Intel I486-based server with a 100-user license costs \$19,795.

Dasher, Avilion and Eclipse systems can now be integrated under Netware local-area networks.

**DG**  
3400 Computer Drive  
Westboro, Mass. 01580  
(508) 366-8911

Hayes Microcomputer Products, Inc. has announced the ISDN System Adapter, an exter-

nal multimedia adapter for personal computers, workstations and hosts supporting Integrated Services Digital Network (ISDN) communications.

The adapter supports telephone, answering machine, Group III facsimile and modem transmissions and meets National ISDN 1 specifications.

It provides direct access to 64K bit/sec. B-channel bit stream for transparent data transmission.

The product costs \$1,599. Through December, Hayes is offering a two-for-one special sales promotion, limited to two units per site.

**Hayes Microcomputer Products**  
705 Westech Drive  
Norcross, Ga. 30092  
(404) 449-8791

**Local-area networking software**

EDI Communications Corp. has announced a 16M/4M bit/sec. Token Ring network diagnostic tool for the Apple Computer, Inc. Macintosh.

Mactoken 3.2 runs on Tri-data Systems, Inc.'s Lanway TR 16/4 Token Ring adapter for the Macintosh. Mactoken offers data frame captures and real-

time network performance graphs, among various other features.

The product costs \$2,500 including an Appletalk interpreter. Without the interpreter, the price is \$2,000.

**EDI Communications**  
Suite 4E  
20440 Town Center Lane  
Cupertino, Calif. 95014  
(408) 996-1343

**Electronic mail**

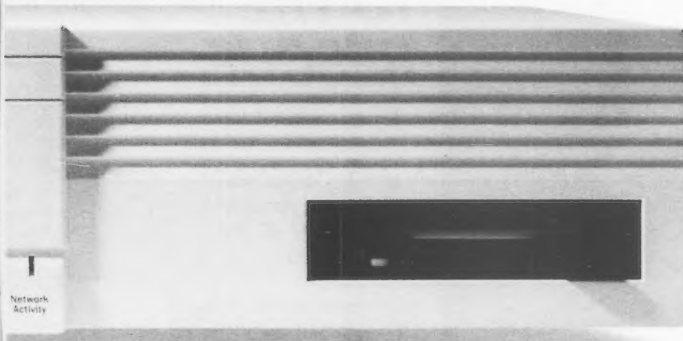
Reach Software Corp. has announced availability of Mailman, an electronic mail software package supporting access to standard mail servers, databases and applications.

Mailman runs under Microsoft Corp.'s Windows 3.0 and Banyan Systems, Inc.'s Virtual Networking System. According to the company, Mailman will eventually support all major network operating systems. The product implements store-and-forward technology to transmit information to and from users and applications.

A license for up to 20 users costs \$995. An unlimited user license costs \$1,995.

**Reach Software**  
330 Potrero Ave.  
Sunnyvale, Calif. 94086  
(408) 733-8685

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well as tailor resource connection options for the user and offer them on a menu.

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# "CAMBEX IS INTRODUCING SHORT-TERM MEMORY RENTAL— JUST WHEN I NEED IT MOST."

If you are like most IBM System/3090 mainframe users, the effect of tight economic conditions, internal streamlining and restrictive budgets has made cost savings a key goal.

Cambex can help you reach it. Because now, for the first time, Cambex is offering 3090 and ES/9000 users a short-term memory rental and leasing program that gives you maximum flexibility, configurability and freedom of action at the lowest prices ever seen.

As mainframe upgrades have grown more frequent and complicated, many users do not want to lock into fixed storage configurations or capacities under a long-term lease.

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frames from a single pool of rented or leased cards, for even more savings.

Cambex factory-trained technicians install and reconfigure the storage cards in just a few hours. At no cost to you. And for any rental period of 90 days or more that your site requirements demand.

If you are an IBM mainframe user, turn to Cambex for your memory today. If you are planning to acquire a 3090 or ES/9000 in the future, get just the processor and leave the memory to Cambex. You'll see savings you never thought possible.

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Waltham, MA 02154  
617-890-6000

**Cambex**

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# MANAGER'S JOURNAL

## EXECUTIVE TRACK



**Gary D. Ginter** has been named managing director of **Globex Corp.**, which will operate the global automated after-hours trading system for futures and options traded on the Chicago Mercantile Exchange and the Chicago Board of Trade.

Globex is a joint venture of the Merc and the Board of Trade and will operate a trading system developed by Reuters Holdings PLC. Reuters will supply the computer and global network.

Ginter, 44, was one of the founding principals of Chicago Research & Trading Group Ltd. (CRT) and has been a proponent of technology development in the futures industry for the past 15 years. CRT has 750 employees doing business on major futures, options and stock exchanges. Ginter was responsible for CRT's relations with U.S. and foreign regulators and for developing several of the firm's foreign involvements.

Ginter has served on the federal Office of Technology Assessment's special advisory panel on securities markets and information technology. He has also served on the strategic planning committee of the Board of Trade.

He is a Phi Beta Kappa graduate of the University of Southern California.

**Michele Fainor** has joined **Sungard Recovery Services, Inc.** in Wayne, Pa., as a programmer/analyst in the product development department.

Fainor was formerly a programmer/analyst at The Arbitron Co. in West Chester, Pa. She holds a bachelor's degree in mathematics and computer science from Pennsylvania State University.

### Who's on the go?

When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

## IS power to the (retired) people

American Association of Retired Persons head wields computers as political weapon

BY GARY H. ANTHES  
CW STAFF

**H**orace B. Deets is a soft-spoken man whose self-deprecating style belies his post as the head of the largest and possibly most powerful membership organization in the U.S. But his low-key style cannot hide a passion for the welfare of his 33 million members — half of all Americans over the age of 50 — or his zeal for the information systems needed to manage his huge operation.

Deets is executive director of the American Association of Retired Persons (AARP), but none of the images suggested by the word *retired* fit the Washington, D.C.-based association. AARP has 1,600 employees backed by an army of 370,000 volunteers in 4,000 local chapters.

It garners more than two-thirds of its \$300 million annual revenue from a bevy of big business activities aimed at older Americans — from mutual funds to pharmacy services to travel to health insurance. It publishes a slick magazine, *Modern Maturity*, that has the highest circulation of any magazine in the U.S. To top it off, AARP enjoys a political clout that puts the National Rifle Association to shame.

Behind all that are computer and communications systems, and behind those stands computer enthusiast Deets — pushing, pulling and prodding information technology. "I'm very curious about technology. My wife calls me a gadget freak," Deets says. He has personal computers at home, in his office and on his lap when he travels. He spends between 30 minutes and two

### PROFILE: Horace B. Deets



Katherine Lambert

**Position:** Executive director of the American Association of Retired Persons

**Mission:** Applying technology to meet the changing needs of AARP's members

hours per day communicating with his staff and board members by electronic mail and monitoring the performance of the association by downloading data from AARP's Digital Equipment Corp. VAX computers.

When asked about IS strategy, Deets relates a tale from *Alice in Wonderland*. "The caterpillar asked Alice

where she was going, and she said she didn't know," he recounts. "Then any road will take you there," the caterpillar says. It's absolutely essential that we have a vision of where we want to go."

The 53-year-old South Carolinian's vision places strong emphasis on the application of technology to meet the

*Continued on page 69*

## MBAs to receive more technology education

BY MITCH BETTS  
CW STAFF

**B**usiness schools will soon be making curriculum changes to ensure that when MBA graduates show up for work in corporate America, they have a broad understanding of the role that technology plays in all facets of modern commerce and business.

The St. Louis-based American Assembly of Collegiate Schools of Business (AACSB), which accredits business schools, revised its curriculum standard late last month to require coverage of technology's influence on business, but the standard gives schools plenty of flexibility in how they comply.

Schools could start a course on managing technology, or the topic could be incorporated in courses for each of the business functions, such as marketing, accounting and human resources man-

agement, AACSB officials said. Either way, they said they expect schools to be experimenting with ways to provide MBAs with "cross training" in technology.

Although many MBA programs already require a course in information systems, the new standard is intended to expose students to non-IS technology subjects as well, such as factory technology, biotechnology and management of research and development.

Michael Stahl, associate dean at the University of Tennessee's business school, predicted that many schools will implement the broader requirement by starting a technology appreciation or technology management course in addition to the IS course, not as a replacement. "My guess is that will increase the amount of education concerning technology, not detract from it," he said.

Richard J. Lewis, president-elect of

the AACSB and dean of Michigan State University's business school, said the change was promoted by the AACSB's Strategic Issues Committee, which identified three cross-disciplinary themes that need to be integrated into the business curriculum: globalization of markets and organizations, management of technology and the demographic diversity of the work force and marketplace.

Eventually, the topic of technology management should be blended into virtually every business course, but business schools will first need to educate their own faculty members, said Brandt R. Allen, professor of business administration at the University of Virginia in Charlottesville. "Quite frankly, not all of us are blessed with faculty who have a keen awareness of how information technology is changing everything we do."



CALENDAR

MAY 26-JUNE 1

**Database World Conference and Exposition.** Washington, D.C., May 28-30 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

**Client Server '91.** Chicago, May 28-31 — Contact: Bonnie Sen, Washington University, St. Louis, Mo. (314) 889-5380.

**DB2 Productivity Tool Seminar.** New York, May 29 — Contact: DB2 and SQL Users, New York, N.Y. (212) 866-7563.

JUNE 2-8

**International Communications Association Conference and Exposition.** Anaheim, Calif., June 2-7 — Contact: ICA, Dallas, Texas (214) 233-3889.

**Building Systems Automation-Integration Symposium.** Madison, Wis., June 2-8 — Contact: Charles E. Dorgan, University of Wisconsin at Madison (608) 262-8220.

**Information Management: The Next Generation.** Orlando, Fla., June 4-6 — Contact: Delphi Consulting Group, Boston, Mass. (617) 247-1511.

**Systems Integration Exposition and Conference.** Rosemont, Ill., June 4-6 — Contact: Sandi Eberhard, Eberhard & Co., New York, N.Y. (212) 557-6950.

**Voice Systems Worldwide 1991.** Kensington, England, June 4-6 — Contact: Media Dimensions, Inc., New York, N.Y. (212) 533-7481.

**Techconnect Washington, D.C.** Washington, D.C., June 4-6 — Contact: Techconnect Washington, D.C., Austin, Texas (512) 343-9066.

**Downsizing Corporate Computing.** Chicago, June 4-6 — Contact: Bob Daniel, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

**Managing Office Ergonomics: Toward a National Consensus.** Tysons Corner, Va., June 5-6 — Contact: The Center for Office Technology Conference, Washington, D.C. (202) 466-7810.

JUNE 9-15

**The Security Impact of Networks, Telecommunications and Office Automation.** Denver, June 10-12 — Contact: Computer Security Institute, San Francisco, Calif. (415) 905-2626.

**Unix Summer 1991 Technical Conference and Exhibition.** Nashville, June 10-14 — Contact: Unix Conference Office, El Toro, Calif. (714) 588-8649.

**Computer Security Institute.** Denver, June 10-12 — Contact: Computer Security Institute, San Francisco, Calif. (415) 267-7651.

**Experts on Networks.** Washington, D.C., June 10-12 — Contact: Technology Transfer Institute, Santa Monica, Calif. (213) 394-8305.

**FDDI Executive Symposium.** Sunnyvale, Calif., June 11-12 — Contact: Joan Marie McArdle, Events Management International, Marshfield, Mass. (617) 834-4703.

**EDI: Steps for Success.** Atlanta, June 11-13 — Contact: Sharon Scott, Inforum, Atlanta, Ga. (404) 220-2692.

**Strategic Planning for Information and Systems.** Chicago, June 12-14 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

**Windows 3.0 Developers Conference.** Tyngsboro, Mass., June 12-14 — Contact: Andree Fontaine, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

**The Bynet User Group.** Orlando, Fla., June 13-14 — Contact: Christine Seale, Bytex, Southboro, Mass. (508) 480-0840.

JUNE 16-22

**National Educational Computing Conference.** Phoenix, June 16-20 — Contact: Southwest Events, Scottsdale, Ariz. (602) 991-5131.

**American Institute of Certified Public Accountants' Microcomputer Conference and Exhibition.** New Orleans, June 16-19 — Contact: AICPA, New York, N.Y. (212) 575-6200.

**Office Automation Society International Educational Conference.** Alexandria, Va., June 16-19 — Contact: OASI, McLean, Va. (703) 821-6650.

**Cincom's 1991 International User Conference.** Cincinnati, June 16-20 — Contact: Cincom Systems, Inc., Cincinnati, Ohio (513) 662-2300.

**Government Management Information Sciences Conference.** Salt Lake City, June 16-20 — Contact: Government Management Information Sciences headquarters, Wichita Falls, Texas (817) 692-3707.

**Conference on Image Processing.** Tyngsboro, Mass., June 17-19 — Contact: Andree Fontaine, Boston University Corporate Education Center, Tyngsboro, Mass. (508) 649-9731.

**MIT Center for Information Systems Research Summer Session.** Cambridge, Mass., June 17-20 — Contact: CISR, Cambridge, Mass. (617) 253-6657.

**Testing Computer Software.** Washington, D.C., June 17-20 — Contact: U.S. Professional Development Institute, Silver Spring, Md. (301) 445-4400.

**Downsizing in the Computer Industry: Making the Migration from Reliance on Mainframe to Distributed Processing in the Mini, PC and LAN Environment.** New York, June 19-20 — Contact: Institute for International Research, New York, N.Y. (212) 826-1260.

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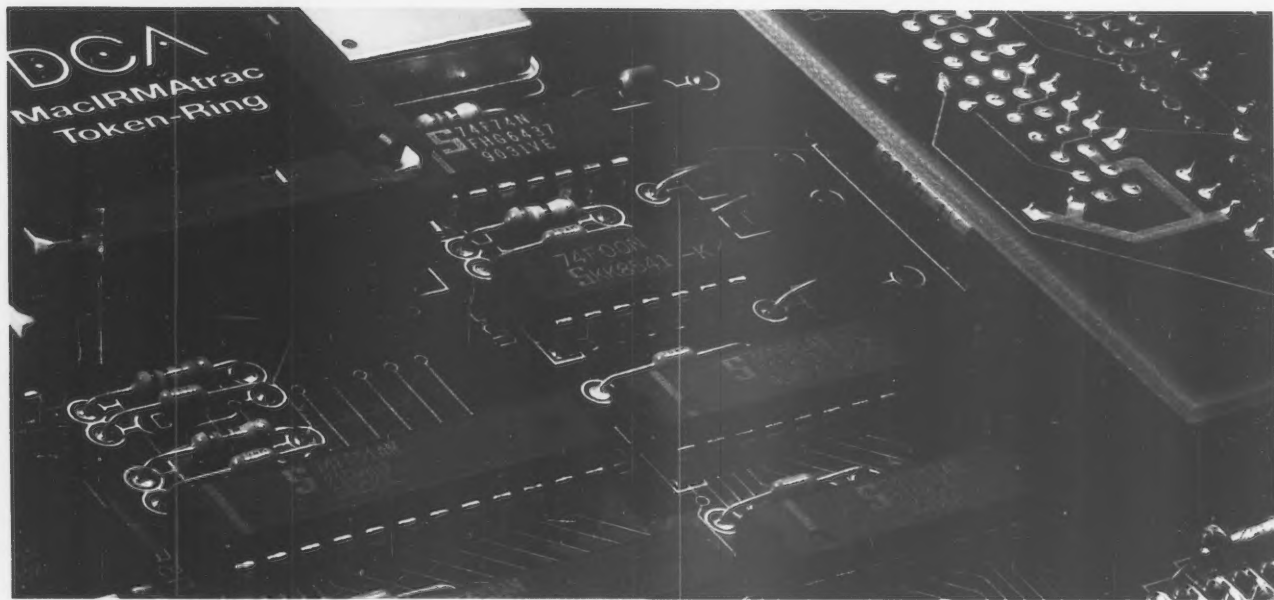
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# The biggest computer news isn't just coming out of Apple. It's going into it.

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*With our replaceable RIM technology, you'll never have to worry about buying another token-ring board.*

With DCA's MacIRMAtrac, Macintosh® users can handle many different growth possibilities both now and in the future. This unmatched flexibility is the result of our replaceable ring interface module (RIM) technology that allows a single token-ring board to adapt in many ways.

By offering 4 Mbps and 4/16 Mbps

RIMs, and 4/16 fiber optic RIMs in the near future, MacIRMAtrac is truly the ultimate solution to meet all of your token-ring connectivity needs.

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DCA's MacIRMAtrac supports all Macs with NuBus (Mac II) architecture

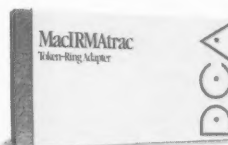
and it's fully compatible with AppleTalk®. And combined with our award winning MacIRMA® WorkStation 3270 software, MacIRMAtrac now allows you to connect with more SNA environments than with any other Mac-to-mainframe solution.

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# Quality controls underused

Study shows firms fail to take advantage of their computerized systems

BY MICHAEL FITZGERALD  
CW STAFF

CHICAGO — Most manufacturing companies have some form of computerized quality control in place and will greatly increase spending on such automated quality systems this year, but most firms could be using their systems more effectively, according to a recent study.

The blind study, commissioned by SPSS, Inc., a maker of statistical software, polled 222 engineers, managers and executives at U.S. manufacturing companies.

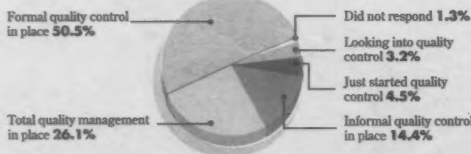
More than 90% of the companies surveyed said they practice some form of quality control, and 26% have implemented Total Quality Management programs such as those designed to compete for the Malcolm Baldrige Quality Awards that are given out by the U.S. Department of Commerce.

Respondents noted three top reasons for implementing quality control. Pride in the product was cited by 85% of respondents, management's commitment by

## Pushing quality as job one

More than 75% of the manufacturing firms surveyed had either a formal quality control program or a total quality management program in place

Percent of respondents; base of 222 manufacturing companies



Source: Alphastat Research Corp.

CW Chart: Tom Monahan

78% and the need for feedback on out-of-control processes by 73%.

### Lost control

Firms using computer systems to track quality have implemented sampling, inspection and charting programs. Although a large number of firms use systems, many fail to regularly review the data they collect.

For example, while 61% said computerized systems were in place on the factory floor, only

29% indicated that quality control data was used for real-time reactions.

Most respondents said their companies will spend as much on quality control hardware and software in 1991 as they did in the last two years combined.

According to SPSS, it commissioned the survey, conducted by Sharon, Mass.-based Alphastat Research Corp., in order to seek out potential customers for its Quality Manager software package.

## MANAGEMENT BRIEFS

# CEOs to speak at SIM

Four chief executive officers and three senior business executives from user firms have been named as speakers for the Society for Information Management (SIM) annual conference next fall in Chicago.

The conference theme is "Focus on the Basics," one aspect of which is using information systems as a catalyst to establish total quality in an organization.

Two speakers from Malcolm Baldrige Quality Award-winning companies will be featured: Xerox Corp. President and CEO Paul A. Allaire and IBM Senior Vice President Stephen B. Schwartz.

Other CEO speakers are the heads of three companies noted for innovative use of IS: Robert L. Crandall of American Airlines, Ronald J. Gidwitz of Helene Curtis, Inc. and Richard F. Teerlink of Harley-Davidson, Inc.

Other high-ranking business executives who will speak on IS in their companies are James E. Annable, senior vice president and chief economist at First National Bank of Chicago, David Hale, first vice president

and chief economist at Kemper Financial Services, Inc., and Larry K. Switzer, senior vice president at S. C. Johnson & Son, Inc.

The conference will be held Oct. 6-10 at the Chicago Marriott Downtown. SIM can be contacted at (312) 644-6610.

Lawrence A. Higgason, principal founder and first managing director of the Automotive Industry Action Group, has been named to the board of directors of Genzlinger Associates, a Troy, Mich.-based provider of communications and software systems to the automotive and repetitive manufacturing industries. He will also provide consulting assistance to Genzlinger.

Higgason spent 20 years at Ford Motor Co. in materials management, business planning and internal consulting. After that, he worked at Deloitte Haskins & Sells and then Renault Automotive Co. in Paris, where he led development and implementation of electronic data interchange, bar coding and computer systems improvements.

# A TOAST TO THE SWEDISH S

IDEAssociates, Inc., 29 Dunham Road, Billerica, MA 01821 (508) 663-6878; FAX (508) 663-8851; European Headquarters (France), 33-14-035-5858; Asia/Pacific (Hong Kong), 852-5-420172; United Kingdom, 44-1-390-5945. IDEA are registered trademarks of IDEAssociates, Inc. Servcom is a registered trademark of IDEA Courier, Inc.

## IS power

FROM PAGE 65

changing needs of AARP's members. Shortly after becoming executive director in 1988, Deets pressed for the development of a correspondence tracking system, which is used to analyze issues and track opinion trends.

Since joining AARP nearly 15 years ago, Deets has held a succession of management positions in legislation, human resources and communications before becoming executive director. Earlier, he worked for the Equal Employment Opportunity Commission and was director of outreach at the Washington Hospital Center's project for alcoholism and drug abuse.

As AARP director, Deets also asked for an executive information system (EIS), which is being developed by AARP and tested by Deets.

Before Deets begins a trip out of town, the system combines data from several sources to produce a highly tailored briefing sheet telling him about the area he's visiting — membership statistics and key issues of interest to AARP members.

"I can tell the governor of California that 10% of the state's population — 3 million people —

are AARP members," Deets says. "That gets his attention."

Deets also taps into his 1,500-name electronic Rolodex to print out a list of people in the area being visited. Deets says he works 60 to 70 hours per week.

He uses the EIS to access databases of financial, human resources, membership, legislative and volunteer information, looking for things such as unfavorable budget variances.

He can graphically display the results and print them in his office. "I might write a note on it — 'What's going on here?' — and then send it to someone," he says. "That opens some eyes."

### Team effort

Unlike Alice, Deets knows where he wants to go, but he insists he does not tell his staff how to get there. "I harbor no illusions [that] I run this place single-handedly," he says. "I'm trying to be a catalyst to get things done, to be coach, quarterback, cheerleader, water boy. [IS Director] Steve Cablk has enormous freedom."

"Horace is very supportive," Cablk says. "He understands what we do, and he understands technology and its value. At other places, [computer technology] is viewed as an expense, not an asset." Cablk says Deets focuses

on user functionality, not technological glitz.

"I do a lot of listening," Deets says. "We've probably had more retreats than any monastery in the country."

A group Deets listens to a great deal is his board of directors. The 21 board members, who have an average age of 70, are scattered across the U.S. but tied to Washington via home computers connected to AARPnet.

AARPnet allows board members and about 100 key AARP volunteers to learn of Washington goings-on as they happen, while bringing their reactions back to AARP headquarters via E-mail.

The electronic tie-in is part of Deets' strategy to decentralize in order to get closer to the membership. AARP came under criticism — Deets says unfairly — after a catastrophic health care bill was passed by Congress at the urging of AARP, then repealed when AARP's members decided it was not what they had in mind.

Deets says the problem was the structure of the program as stitched together by Congress, "but there was the perception that there was insufficient input from the grass roots."

Now, AARP's highest priori-

## Keeping current

Although AARP Executive Director Horace Deets loves the personal computer on his desk, AARP's \$18 million information systems budget and 200-member IS staff support a good deal more than that.

AARP runs two large data centers, one with a cluster of five DEC VAXs in Washington, D.C., and one boasting an IBM Enterprise System/9000 mainframe in Lakewood, Calif.

The data centers are connected to each other by a 1.5M bit/sec. data line and to 15 remote sites via dial-up circuits.

This summer, AARP will move its Washington operations into a new building, one fitted with a Fiber Distributed Data Interface (FDDI) backbone. Each floor will have a local-area network and an FDDI-to-Ethernet bridge tying the LAN to the backbone. Users needing more computer capacity than is on their desks can go to the LAN server, to another LAN or to the data center. "The network will be the computer," IS Director Steve Cablk says.

AARP has about 100 applications systems. One large batch system adds 10,000 new members per day to AARP's membership rolls while processing 20,000 to 30,000 renewals.

Another application is a custom-built database that keeps track of AARP's 370,000 volunteers, including their locations, specialties and current activities.

GARY H. ANTHES

ty is a national health care system. In this project, as with nearly all of AARP's activities, computers are likely to play an important role. For any issue of interest to AARP members, a highly targeted mailing can be

generated, which requests that key members write to their legislators.

"You generate 50,000 handwritten letters to a congressman's office, and you've got his attention," Deets says.

# SAFETY STANDARD.

Here's to the world's strictest standard concerning terminal ergonomics and very low frequency emissions—the Swedish Recommendation. And here's to the first line of coax and twinax displays in North America to comply with this standard—IDEA's.

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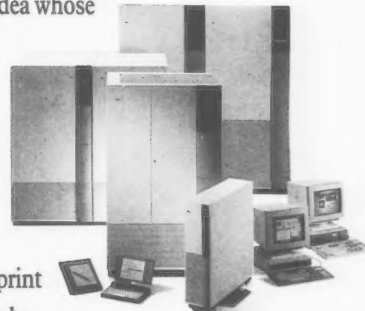


# anization Still Yesterday's Technology?

## **NCR System 3000 Makes Conventional Mainframe Technology Cost-Prohibitive.**

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# PRODUCT SPOTLIGHT

## Superman? No, super server

*LAN server vendors are touting power and speed, but buyers need to decide how much is actually too much*

BY SHARON FISHER

It's getting more and more difficult to distinguish advertisements for network servers from ads for sports cars. With the emphasis on speed, power and performance, about all that's missing is the announcement in tiny print at the bottom: "Performance may vary."

Practically every hardware manufacturer has dibs on the high-gloss server market, whether it sells a minicomputer, a reduced instruction set computing (RISC) server or an Intel Corp. 80386- or I486-based machine. But the most recent and visible entrants in the price/performance rally are vendors that sell "superservers."

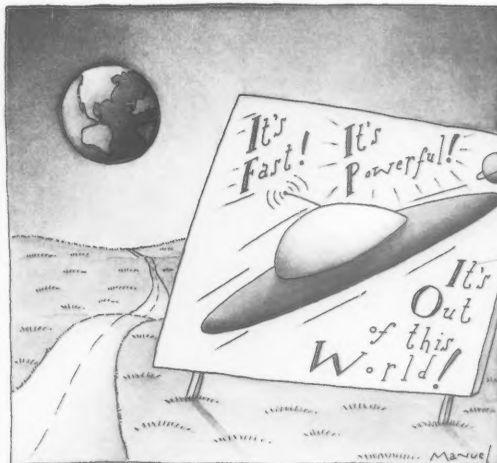
Those that hawk the loudest, however, are also currently selling the fewest machines. Despite all the attention they've received, superservers have a "small but growing" market status, according to David Passmore, a partner at Ernst & Young in Fairfax, Va.

There are a couple of reasons for the low number of shipments. For one, while price/performance ratios on superservers soar over their higher and lower end counterparts — the minicomputer and the personal computer — not everyone is ready for such a high-powered machine. Least ready are the software vendors, which are just beginning to catch up with the functionality offered by these relatively new machines.

Secondly, while the term "superserver" has been stretched to cover a range of machines, true superservers are actually few in number.

These machines are not simply souped-up PCs intended to run everyday tasks of data and file serving. Superservers are optimized from the get-go to handle either very large file sharing responsibilities or mission-critical applications that may previously have been run on

Fisher is a San Francisco-based freelance writer specializing in data communications.



Manuel King

a minicomputer or mainframe. Their prime characteristics can be boiled down to include the following:

- More than one high-performance Intel I486 microprocessor.
- As much as 12M bytes of memory and 1G byte of disk space.
- Fault tolerance through extra hard disks and disk controllers.
- Enhanced buses to improve performance.

Superservers are likely to find work as replacement machines for larger computers running mission-critical applications.

"Minicomputers can operate in office environments, but because of their [large] packaging and footprint, they usually end up in dedicated spaces," says Kevin O'Neill, vice president of network research and consulting at Business Research Group in Newton, Mass. "Superservers

lend themselves to being implemented in distributed spaces, such as regional offices."

### Choice for large LANs

While traditional PCs are fine for most file serving tasks, Passmore says companies with 100 or more PCs on a single local-area network could use a superserver.

An organization that has outgrown its current server and is reluctant to break up its LAN into several subnets may also consider a superserver, says David Ferris, president of Ferris Networks, Inc., a consulting firm in San Francisco.

For both purposes, superservers offer a host of hardware advantages over PC-based servers. O'Neill points to their scalability as a prime advantage. Users can add power as they need it, beyond the point at which the standard server runs out of gas.

Superservers also provide multiprocessing, or the ability to divide work between one or more processors. This allows the machine to support more users at the same time.

There are two types of multiprocessing: symmetric, where both processors perform the same tasks, and asymmetric, where one processor may be used for network processing and one for file access, Passmore says.

With asymmetric multiprocessing, each processor is optimized to perform a specific task, whereas with symmetric multiprocessing, any task can be executed by either CPU on a first-come, first-served basis.

Opting for one type or the other depends largely on which network operating system you are running. Novell, Inc.'s Netware supports asymmetric processing, while Microsoft Corp.'s LAN Manager and Banyan Systems, Inc.'s Virtual Networking Software (Vines) support symmetric.

### Upping performance

Disk arrays are another performance booster: They allow the superserver to support multiple disk drives. "You can take a file and spread it across multiple hard drives, which allows you to have simultaneous reads and writes," Passmore explains. The Systempro from Compaq Computer Corp. is one machine that supports this feature, and NCR Corp. has come out with a chip that supports disk arrays as well, Passmore says.

Improving performance further are the nonstandard buses used by many superservers. However, there is a trade-off in using a proprietary bus. Without the standards, users will find it more difficult — and expensive — to find adapters and other add-ons for the machine.

Herein lies the biggest problem with superservers: None of the added hardware benefits do users any good without software that can exploit them.

For instance, superservers  
*Continued on page 78*

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### Safe Routes

There are a variety of ways to get fault tolerance. Page 79.

### Product Guide

A comprehensive listing of Intel-based superservers. Page 74.

### RISC Speeds

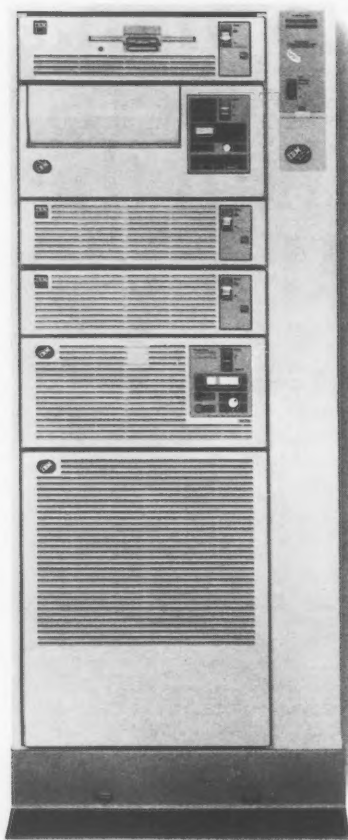
RISC servers are worthy competitors of superservers. Page 80.





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For LAN managers, there are new tools to help you locate, solve and prevent problems more easily.

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The IBM logo, consisting of the letters "IBM" in a bold, sans-serif font with horizontal stripes through the letters.

VENDOR	PRODUCT	NUMBER OF PROCESSORS	OPERATING SYSTEMS SUPPORTED	NETWORK OPERATING SYSTEMS SUPPORTED	CLOCK SPEED (MHz)	RAM STANDARD/MAXIMUM (BYTES)	CACHE SIZE <sup>1</sup> (BYTES)	MAXIMUM DISK CAPACITY (BYTES)	TYPICAL WORK GROUP SIZE	FAULT-TOLERANT CAPABILITIES	BUS ARCHITECTURE	EXPANSION SLOTS	I/O PORTS	MONITOR (MONOCHROME/COLOR)	PRICE AND CONFIGURATION
Unisys Corp. <sup>2</sup> (215) 986-4011	U6000/65	5	Unix SVR4, multiprocessing extensions	LAN Manager/IX, proprietary PC interface, Portable Network	33	16M/256M	8K, 256K	42.9K	32-128	Mirroring	EISA	8 EISA	256	Mono-chrome	\$35,000 with 16M-byte memory, 340M-byte hard drive, floppy drive, tape drive
	U6000/75	2-10	Unix System V, (AT&T Unix System V Release 3.2)	Portable Network	25	40M/128M	8K, 512K per CPU	14.9G	96-256, 400 (maximum)	Cache, mirroring, redundant components	Proprietary system bus, multibus, SCSI, ESMD	6-14 multibus, 5 system	1 to 2 Ethernet, 16-96 asynchronous, 0-10 synchronous, 1-5 parallel printer	Mono-chrome	\$183,900 with 4 CPUs, 40M-byte memory, 380M-byte hard drive, 16 asynchronous ports, 1 Ethernet port, 1 parallel printer port
	U6000/85	2-30	Unix System V	Portable Network	25	64M/384M	8K, 512K per CPU	89.9G	128-512, 1000+ (maximum)	Cache, mirroring, redundant components	Proprietary system bus, multibus, SCSI, ESMD	11-44 multibus, 18 system	1 to 4 Ethernet, 16-256 asynchronous, 0-10 synchronous, 1-9 parallel printer	Mono-chrome	\$290,400 with 4 CPUs, 64M-byte memory, 380M-byte hard drive, 16 asynchronous ports, 1 Ethernet port, 1 parallel printer port
Wyse Technology, Inc. (408) 473-1200	Series 7000	1-3	Wyse Unix System V/386	Network Information System	33	4M/192M	8K, 128K	3.6G SCSI	64	Mirroring	EISA, proprietary internal 64-bit bus	9 EISA, 4 proprietary	9 EISA, 4 SCSI, 2 RS-232, 1 Centronics parallel, 1 mouse, 1 Ethernet, 1 Multidrop	Both	\$14,990 with 1 CPU, 4M-byte memory, 525M-byte tape, 1.44M-byte floppy drive
	Series 9000	1-8	Wyse Unix System V/386	Network Information System	25	8M/256M	8K, 128K	4G SCSI	128	Mirroring	Proprietary 30-bit internal bus, external VME bus	7 system, 4 VME, 2 Multidrop	2 dual-channel SCSI, 4 VME, 2 RS-232, 1 Centronics parallel, 1 Ethernet, 1 Multidrop	Both	\$38,500 with 1 CPU, 8M-byte memory, 525M-byte cartridge tape, 1.2M-byte floppy drive

Continued from page 73

may be well-suited to run client/server applications, but there is very little shrink-wrapped software available in that category. Users can develop their own applications, but few tools are available at the moment to help users write them.

Superservers "seem to be a very cost-effective way to support client/server computing," Passmore says, "but it's difficult to develop back-end applications for those machines because of a lack of appropriate CASE tools."

An even larger problem is lack of support from the network operating systems.

So far, few can take advantage of sophisticated features such as multiprocessing. When they do, they can support only one machine at a time because the nonstandard hardware features on superservers require individualized tweaking of the network operating system.

### Relative merits

Superservers have the highest growth forecast by far, although all server types are expected to drop in price

Dedicated server type	Average configuration pricing <sup>3</sup>		Total worldwide market value (in millions)		
	1990	1993	1990	1993	CAGR
PC-based (386 or 486)	\$18,250	\$17,250	\$5,760	\$15,316	39%
Superservers <sup>1</sup>	\$31,800	\$30,500	\$1,165	\$5,991	73%
Fault-tolerant <sup>2</sup>	\$67,450	\$61,075	\$402	\$546	11%
Mini and mainframe	\$96,500	\$86,000	\$1,800	\$1,415	(8%)

<sup>1</sup> Includes machines with proprietary operating systems and multiprocessors such as Netframe Systems, Inc. and Tricord Systems, Inc.

<sup>2</sup> Includes machines such as Tandem Computers, Inc., Stratus Computer, Inc., Parallax Computer, Inc.

<sup>3</sup> Average configuration was determined by the CPU capacity, I/O, memory and storage requirements recommended by vendors and dealers.

Source: Workgroup Technologies, Inc.

CW Chart: Janell Genova

"The superserver vendors have had to work carefully with the network operating system vendors to get them to develop, in essence, a custom-tailored version of the network operating system that supports their particular hardware," Passmore says.

### Symmetric Vines

Banyan worked with Compaq to develop a symmetric multiprocessor version of Vines that can support up to eight processors, says Dana Rasmussen, Vines' product marketing manager.

In fact, some consultants say Vines is the most advanced network operating system in its superserver support because it can also take advantage of high-capacity disks, tape drives and large amounts of memory.

However, Vines supports only a few superservers: Compaq's Systempro, multiprocessing servers from Advanced Log-

## Superservers need TLC

Like exotic animals, superservers require a lot of care and feeding. Support and maintenance are the biggest challenges these machines face, with their large disk arrays, multiple processors and other sophisticated features, especially when people are running mission-critical applications, says Kevin O'Neill, vice president of network research and consulting at Business Research Group in Newton, Mass.

Because of concern about resellers' ability to provide such sophisticated support, many users prefer to get their support directly from the manufacturer, says David Passmore, a partner at Ernst & Young, a market research firm in Fairfax, Va. "Finding a dealer who knows how to support one of these machines may be a more important factor than knowing which machine has higher performance," he says.

Superservers may also require separate, more expensive maintenance contracts, warns David Ferris, president of Ferris Networks, Inc., a consulting firm in San Francisco. For that reason, he advises users to consider superservers from vendors with which they already have support contracts.

SHARON FISHER

ic Research, Inc. and, in the future, the AT&T Starserver. The company is "in discussion" with several other hardware vendors, Rasmussen says.

Microsoft announced in December a multiprocessor version of LAN Manager that was also written for the Compaq Systempro. The firm has also announced support for Parallax Computer, Inc., Netframe Systems, Inc. and Tricord Systems, Inc.

Novell has announced it will provide support for multiprocessors with SFT Level III, but it does not support it now, says David Owen, vice president of engineering at the company.

According to Owen, Novell also believes it is up to the hardware manufacturer — not Novell — to exploit superservers' more powerful features.

"We don't write a specific version of Netware to take advantage of companies' individual performance things," Owen

says. "They can write a Netware Loadable Module themselves to enhance their machine." One vendor that has done so is Netframe, he says, but that was mainly for installation and not performance purposes.

Regardless of whether any tweaking is done to the network operating system, the power of the superserver will still enhance its performance, and speed will still be superior to that of PCs.

### Pricey

Aside from limited software, the optimized features of superservers have another downside: They are expensive.

"Superservers are expensive in terms of direct cost," Ferris says, "but most important, in terms of their life cycle. You need to amortize them over a year and a half or two years and completely write them off at the end of that time." PCs have the

same life cycle, but they are less expensive, of course.

Furthermore, unlike PCs, machines designed specifically as servers cannot be used for much else once their life cycle is up, Ferris adds. "The ability to reuse these products is very, very limited. Usually you can't, so you're just going to have an expensive doorstop at the end of that time," he says.

Regardless of the pitfalls, consultants say, superservers will eventually come into their own as more companies seek replacement platforms for mini-computers and mainframes.

The maturation will depend to a large degree on network operating systems development. "The issue really gets down to the operating system," O'Neill says. "If the server environment you're running can support the right operating system environment, the underlying technology becomes less of an issue." •

## More than one way to achieve fault tolerance

The usual fault-tolerant functions found on personal computers may not cut the mustard when the devices assume some of the mission-critical applications of minicomputers and mainframes.

Consequently, superserver manufacturers are touting not only speed but also one or more forms of fault tolerance — the ability to recover from errors effectively. Like many other characteristics of superservers, this feature originally appeared on minicomputers such as those from Tandem Computers, Inc. and Stratus Computer, Inc.

Most vendors claiming fault-tolerant features protect the machine's disk drives

because they are the parts of the machine most likely to fail. In this vein, fault tolerance tends to fall into one of three areas:

- The easiest way to achieve a level of fault tolerance is to have two copies of the same data on the same disk. This method is inexpensive because it doesn't require another hard disk. While this technique works for errors such as bad sectors, it is not as effective if something happens to the hard disk or hard disk controller.
- A better idea is to use two hard disk drives with a single hard disk controller. This method eliminates problems caused by a faulty hard disk, but if the hard disk controller fails, you lose your data.

• The most reliable and expensive method of fault tolerance is to use two hard disks and two controllers. Novell, Inc.'s Netware, Microsoft Corp.'s LAN Manager and Banyan Systems, Inc.'s Virtual Networking Software support this method to some degree. Novell has announced what is probably the highest level of fault tolerance available, says David Passmore, a partner at Ernst & Young.

Another type of fault tolerance built in to some superservers includes the ability to recover from power failures. For example, Parallax Computer, Inc.'s Server 290 includes a built-in, battery-operated power supply that, in the event of a power fail-

ure, allows the machine to keep running just long enough to store all open files and applications.

Reduced instruction set computing-based servers tend to provide even more fault-tolerant capabilities than do superservers. For example, Hewlett-Packard Co.'s 9000 Model 1240 features multiple "logical servers" in the same cabinet.

In terms of general reliability, it is difficult to determine how superservers compare with the minicomputers they generally replace, says Kevin O'Neill, vice president of network research and consulting at Business Research Group in Newton, Mass. "From a hardware standpoint, they're probably no more or less reliable than minicomputers," he says. •

SHARON FISHER

## Overcrowded conditions

BY JOHN MCDONOUGH

After outgrowing a high-end personal computer not once but twice, Keith Venzke, a local-area network administrator at Scheduled Airlines Traffic Offices, Inc., may opt for a superserver.

Venzke bought The Network Connection's (NET) Triumph TNX 386/33 in January to run the travel agency's airline ticketing database.

The Triumph machine uses Nantucket Corp.'s Clipper over a Novell, Inc. Netware 386-based LAN to maintain ticketing information for all of the agency's sales offices.

The Triumph — which is configured with four 670M-byte enhanced small device interface (ESDI) disk drives — hit the wall at 1.3G bytes of disk storage. This came as a surprise to Venzke, who says he was told he could fit four drives and have 2.7G bytes of continuous storage on one file server.

"I could physically hook up four drives," Venzke says, "but I could only access two of them."

Toby Victor, president of Isyx, Venzke's dealer, says he was told by NET that although its TNX 386/33 server supports only two 670M-byte drives, the drivers allow the servers' ESDI controller to support four drives.

NET did so for Netware 286, but it was too difficult to do the same for Netware 386, Victor says.

Isyx ended up supplying Venzke with a second server to support all four drives.

Venzke says the dual LAN server "blows away" his former server, a Compaq Computer Corp. Deskpro 386/25, but he plans to upgrade to a 10G-byte system eventually. For that, he is eyeing Tricord Systems, Inc.'s Power Frame superserver.

"With our upgrade to 10G bytes — well, NET won't like this, but we're going to go with one file server. NET makes a great product, but I get nervous with a PC holding 10G bytes of data," Venzke says.

McDonough is an editor at Faulkner Technical Reports in Pennsauken, N.J.

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## RISC server leaders

The following are the top six vendors in the reduced instruction set computing (RISC) server market. This list includes products that have shipped since January 1990.

### ▶ Digital Equipment Corp.

(800) 344-4825  
**Decsystem 5000 (Model 200), 5100, 5500**

**Operating systems:** Ultrix, Pathworks for Ultrix.  
**Network protocols:** Transmission Control Protocol/Internet Protocol (TCP/IP), Network File System (NFS), optional Decnet Ultrix.

**Prices:** Decsystem 5000 costs \$14,995 with 8M-byte memory, thin-wire Ethernet, small computer systems interface (SCSI) controller, Ultrix four-user license and Ultrix workstation server license.

**Decsystem 5100** costs \$10,995 with 8M-byte memory, Ethernet port, four asynchronous lines, SCSI controller, 209M-byte SCSI disk drive, Ultrix four-user license and Ultrix workstation server license.  
**Decsystem 5500** costs \$41,900 with 32M-byte memory, embedded Ethernet, SCSI and digital small systems interface controllers, Ultrix four-user license and Ultrix workstation server license.

### ▶ Hewlett-Packard Co.

(800) 752-0900  
**Series 700 Models 720, 730, 750**

**Operating systems:** HP-UX, OSF/1.  
**Network protocols:** ARPA Telnet, TCP/IP, NFS.  
**Price:** \$11,990, \$19,990, \$43,190 with 16M-byte memory, up to 660M-byte hard disk and monitor.

### HP 3000 Series 948, HP 3000 Series 958.

**Operating systems:** MPE/XL, Novell, LAN Manager/X.  
**Network protocols:** IEEE 802.3, X.25, ARPA Telnet, Systems Network Architecture (SNA).  
**Price:** \$107,300, \$229,800

(server versions) with 64M- to 96M-byte memory, 1.3G-byte hard disk, Dataphone Digital Service tape backup, HP's Allbase/SQL, operating system and console.

### HP 3000 Series 980/100, Series 980/200.

**Operating systems:** MPE/XL, Novell, LAN Manager.  
**Network protocols:** IEEE 802.3, X.25, ARPA Telnet, SNA.  
**Price:** \$615,000, \$975,000 with system processing unit, 192M-byte memory, Allbase/SQL and operating system.

### HP 9000 Model 822S, 832S

**Operating systems:** HP-UX Release 7.06.  
**Network protocols:** TCP/IP, ARPA Telnet, NFS, LAN Manager/X, Map 3.0, SNA.  
**Price:** \$19,950, \$32,250 with 8M- to 16M-byte memory, 335M-byte hard drive and eight-user HP-UX license.

### HP 9000 Model 842S, Model 852S

**Operating systems:** HP-UX Release 7.06.  
**Network protocols:** TCP/IP, ARPA Telnet, NFS, LAN Manager/X, Map 3.0, SNA.  
**Price:** \$85,000, \$143,000 with 32M- to 64M-byte memory, 670M-byte hard drive and eight-user HP-UX license.

### HP 9000 Model 860S, 870S/100

**Operating systems:** HP-UX Release 7.06.  
**Network protocols:** TCP/IP, ARPA Telnet, NFS, LAN Manager/X, Map 3.0, SNA.  
**Price:** \$230,000, \$350,000 with 48M- to 96M-byte memory, eight-user HP-UX license and two channel I/O adapters.

### ▶ IBM (800) 426-3333

**RISC System/6000 Powerserver 320**  
**Operating systems:** AIX Version 3 for RISC.  
**Network protocols:** TCP/IP,

## Racy RISC servers put pedal to metal

**W**hen it comes to speed, super-servers face a worthy challenger in RISC servers.

RISC servers are very similar to the workstation versions of the same architecture, according to Phil Magney, general manager at Workstation Laboratories in Irving, Texas. However, they offer much higher capacities than their desktop counterparts in terms of memory, disk storage and I/O boards.

High clock speed RISC processors, combined with large amounts of random-access memory and cache, allow RISC servers to perform CPU-intensive tasks at much higher rates than Intel Corp.-based servers, Magney says.

Benchmarking servers or multiuser systems can be difficult because the actual events must be simulated, he warns. However, it is possible through simulated multiuser benchmarks to determine performance characteristics and the relative strengths and weaknesses of a product.

A good benchmark for measuring multiuser performance is transaction processing. Workstation Laboratories uses a test that is similar to TP1 but written entirely in C for reasons of portability. This test is very disk-intensive and does a good job of measuring multiuser disk access.

The following are average transactions per second based on Workstation Laboratories' transaction processing benchmark as found on a network of 20 users.

- High-end PC: 12 to 18.
- RISC workstation: 12 to 15.
- Multiprocessor machine (superserver): 20 to 30.

### • RISC server: 25 to 40.

Because RISC servers are Unix-based, however, they pose even more complications on the network operating system front than DOS- and OS/2-based superservers.

While the major network operating systems are beginning to support Unix in recent versions, few machines as yet support them, and few users have experience with them.

The most heavily used network operating system is Novell, Inc.'s Netware. Its Portable Netware is more readily ported to chips with different architectures, such as those from Motorola, Inc., Sun Microsystems, Inc. and other RISC chips. Few machines currently support Portable Netware, however (see RISC workstation listing and chart, page 74).

Microsoft Corp. also announced a Unix implementation of its OS/2 LAN Manager, but it is not widely used. Banyan Systems, Inc.'s Virtual Networking Software (Vines) does not support RISC processors such as Sun's Scalable Processor Architecture (Sparc), says Dana Rasmusen, Vines' product marketing manager.

RISC- and Sparc-based servers can support Sun's Network File System, however. This widely supported software stores data in such a way that computers from various vendors can read and understand it, thus enabling file sharing.

NFS is a good environment for client/server applications; however, it does not provide the user shell available from true network operating systems. This shell helps the user access facilities without having to know where they are.

SHARON FISHER

SNA, Open Systems Interconnect (OSI), NFS, NCS.  
**Price:** \$19,312 with 16M-byte memory, 320M-byte fixed disk, Ethernet, SCSI adapter, ¼-in. tape drive, AIX operating system and Fortran.

### ▶ Intergraph Corp.

(205) 730-2000  
**Interserve 2000, 6000, 6105, 6505, 6509**

**Operating systems:** Clix, Decnet, Novell, Inc. Portable Netware, NFS over 802.3.  
**Network protocols:** TCP/IP, ISO/OSI, XNS, SNA, BSC.  
**Price:** \$9,900, \$16,900, \$43,400, \$79,900 and \$99,000.

### ▶ Silicon Graphics, Inc.

(514) 335-1773  
**4D310, 4D/320, 4D/340, 4D/380**

**Operating system:** Irix.  
**Network protocols:** TCP/IP, Decnet, SNA, NFS.  
**Price:** \$24,900, \$59,900, \$84,900, \$144,900 with 8M- to 256M-byte memory and up to 256M-byte disk capacity.

### ▶ Sun Microsystems, Inc.

(415) 960-1300  
**Sparcserver 2**

**Operating system:** SunOS.  
**Network protocols:** OSI, Message Handling System, Internetwork router, X.25.  
**Price:** \$24,595 with 16M-byte memory, 876M-byte SCSI drive, 2.3G-byte 8mm tape, compact disc/read-only memory (CD-ROM) and monitor.

### Sparcserver 470

**Operating system:** SunOS.  
**Network protocols:** OSI, Message Handling System, Internetwork router, X.25.  
**Price:** \$59,900 (SCSI), \$74,900 (IPI) with 32M-byte

memory, 669M-byte SCSI drive, 150M-byte tape, CD-ROM or 911M- to 6M-byte/sec. IPI.

Information compiled by Jodie Naze, a Computerworld researcher, features.

## Another favorite

Some high-power applications demand no less than the performance available on RISC-based servers.

So found 27 research scientists in the radiology department at the University of Washington in Seattle. The researchers, who use Data General Corp.'s Avion, are conducting cancer research by studying complex images of human metabolism on their Apple Computer, Inc. Macintoshes.

Two Avions act as the central source for these images — which can number 40,000 to 60,000 per year — and send them to the Macintoshes across a Novell, Inc. Netware LAN.

Thomas Lewellen, a radiology professor at the university, chose the Avion 6240 and 6220 for performance reasons after evaluating several other workstations, including those from Sun Microsystems, Inc., IBM, Silicon Graphics, Inc. and Hewlett-Packard Co.

According to research scientist Robert Harrison, the Avions topped the other servers when running benchmark tests on the in-house medical imaging applications. Harrison credits the workstation's fast data transfer rates and robust file system for the impressive benchmark results.

The Avion has helped doing the job, however; heavy number crunching is performed on the department's DG Eclipse MV/18000 minicomputer, which downloads the data to the workstations. Previously, all the work was performed on the Eclipse.

"As far as performance and operating cost, [the Avion] is our only option," Lewellen says. "It allows us to solve our compute-time problems at a much more reasonable cost [than other servers], and maintenance problems are much less than with [the Eclipse]."

JOHN MCDONOUGH

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## Distributed DBMS decisions

*Will you go with a client/server DBMS or a 'true' distributed DBMS?  
Find out what makes each distributed computing approach tick*

BY GEORGE SCHUSSEL

**T**hanks to a distributed database management system, Citicorp's securities traders can execute trades, perform analyses and monitor groups for profitability and risk from their desktops worldwide. This New York institution has been using distributed computing during the last few years to gain a technology edge in the cut-throat field of financial services.

Citicorp is doing what many organizations today are only contemplating: distributing data to smaller, cheaper platforms in hopes of achieving distributed computing's much-touted benefits of downsized costs and improved productivity.

What about your company? If you're deciding to distribute, read on. Understanding the two distributed DBMS approaches used today and the products that put them into practice is a key part of your decision-making process.

### Distributed DBMSs

Distributed DBMSs are software products that support distributed computing over a network (see functionality list page 83). At least two separate remote processors split the work for a transaction, with one of the processors supporting DBMS processing.

With the emergence of SQL as a de facto standard, DBMS vendors have begun to add distributed or client/server computing functions to their products as well as support for object approaches, database semantics and relational functionality.

The distribution of relational processing to multiple lower priced DBMS servers, furthermore, enables relational DBMSs to compete effectively in transaction processing. For users, this lowers the cost of computer cycles used.

The distributed DBMS arena primarily consists of "true" distributed DBMS and client/server DBMS approaches. As the downsiz-

Schussel is president of Digital Consulting, Inc. in Andover, Mass., and chairman of the National Database and 4th/5th Generation Language Symposium.

ing trend progresses in the 1990s, information systems shops will turn to true distributed DBMSs and client/server options to provide high-level IS services on "down-priced" personal computer platforms.

The difference between true distributed DBMSs and client/server DBMSs is in the concept of location transparency. With location transparency, a program running at any node need not know the physical location of the computer in which the requested data resides.

True distributed DBMSs support location transparency, with each separate physical node in the network running a copy of the DBMS and associated data dictionary. It is the true distributed DBMS' responsibility to determine an access strategy to that data.

In a client/server DBMS, a limited number of designated nodes run the DBMS. Normally, there will not be a full physical copy of the DBMS at nodes that run the bulk of the

application logic. Client/server DBMSs do not support location transparency, so the application must contain logic that knows where data is located.

In client/server computing, the bulk of the application logic and control of the application rest on the client; the DBMS and data operate on the server.

Although both client/server and true distributed DBMS products support network-based DBMS computing, the approach a company chooses depends on its goals. Client/server DBMSs are based on database machine concepts of the 1980s and are best for high-performance, high-transaction-rate computing. Client/server DBMSs can form the cornerstone of a cooperative processing setup and could help cut the costs of the large systems hardware/software environment for building industrial-strength applications by as much as 90%.

True distributed DBMS products, for their part, can be thought of as the next generation of relational SQL processing. They work well for companies needing higher levels of software functionality. True distributed DBMSs are a good fit in implementing physically separate but logically integrated processing, such as when a manufacturing firm's parts data is located on a warehouse computer while customer data is on the home office computer.

### True distributed DBMSs

True distributed DBMS products occupy the Mercedes-Benz segment of the distributed DBMS marketplace, supporting a local DBMS and data dictionary capability at every network node.

Industry analysts have published "rules" or lists of requirements a fully functional true distributed DBMS should meet. These functions are listed as follows, but they should not be taken as a product feature checklist. Today's products meet some of the requirements, but no product meets them all fully.

For example, many products claim to have software optimizers — intelligent software that determines the best navigation path for an SQL query — but only a few

*Continued on page 82*



Robert Pizzo

- One has location transparency, one doesn't
- Product breakdown
- The two approaches may merge by 1993

Continued from page 81

have good functionality in this area.

• **Location transparency.** Programs and queries access a single logical database view; this logical view is physically distributed over a number of different sites and nodes. Queries access distributed objects for both reading and writing without knowing the location of those objects.

A change in the physical location of objects without a change in the logical view does not require a change of application programs. To meet this requirement, a full local DBMS and data dictionary must reside at each node.

• **Performance transparency.** It is essential to have a cost-based software optimizer to determine the best use of computing facilities in accessing data to satisfy a query.

In doing its job, the optimizer should understand where the data is located, how to access it efficiently, the speed and availability of computing resources and the cost and availability of communications facilities.

With a software optimizer, a query should cost the same amount to run, regardless of whether it originated from point A or point B. Software optimization technology in existing products is primitive.

• **Copy transparency.** As an option, a true distributed DBMS can support multiple physical copies of the same logical data. Advantages to this capability include superior performance gained from having local rather than remote access to data and nonstop operation in the event of one site going down. If a site does go down, the software must be smart enough to reroute a query to another source where data exists.

• **Transaction transparency.** The system supports transactions that update data at multiple sites. Those transactions behave exactly as local ones do; that is, they commit or abort. Distributed commit capabilities are made possible through the two-phase commit technical protocol.

A key concern for users is that two-phase commit uses twice as much communications capability as a more common update process running entirely within one machine. Updating data in a single logical record implemented or duplicated at several physical sites is much more complex than an update process occurring within one computer.

The question for companies, then, becomes whether faster response time, reduced processing costs and improved programming productivity compensate for the increased costs of communications

and management.

• **Fragmentation transparency.** A true distributed DBMS allows a user to cut relations into pieces horizontally or vertically and place those pieces at multiple physical sites. The software is able to recombine those tables into units to answer queries as necessary.

• **Advanced applications development.** The software should support an advanced applications development environment. It should allow the easy creation of business rules that execute on the server.

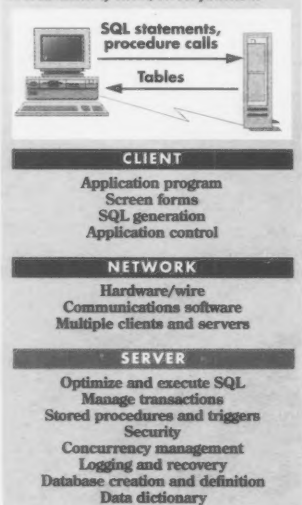
These stored procedures execute from within the DBMS operation. The software should support triggers — rules executed when data equals certain values. Event alerter notice from the database to programs is available.

All of those functions go beyond the basic relational functions of domains, entity and referential integrity. Applications in client machines may be built with fourth-generation languages (4GL).

• **Schema change transparency.** Changes to database object design need be made only once in the distributed data dictionary. The dictionary and DBMS automatically populate other physical catalogs.

• **Local DBMS transparency.** Distributed DBMS services are provided regardless of the brand of the local DBMS. This means support for remote data access and

**What does what**  
A breakdown of client/server functions



Source: Digital Consulting, Inc. CW Chart: Doreen St. John

**Taking sides**

Distinguishing true distributed and client/server DBMS products

CLIENT/SERVER DBMSs
Sybase Corp., Microsoft Corp.: SQL Server
Gupta Technologies, Inc.: SQLbase
Oracle Corp.: Oracle Server
Novell, Inc.: Netware SQL
XDB Systems, Inc.: XDB-Server

Source: Digital Consulting Inc.

**TRUE DISTRIBUTED DBMSs**

Ask Computer Systems, Inc.'s Ingres Division: Ingres Star
Oracle: Oracle
Computer Associates International, Inc.: Datacom
Ashton-Tate Corp.: Interbase
IBM: Information Warehouse
Digital Equipment Corp.: RDB, Information Network

CW Chart: Doreen St. John

gateways into heterogeneous DBMS products is necessary.

There are no products now on the market that support transaction processing standards. The concept of remote procedure calls will eventually enable implementation across heterogeneous DBMS products.

**How the vendors stack up**

Among true distributed DBMS products, the technology high ground is shared by Star from Ask Computer Systems, Inc.'s Ingres Products Division and Interbase from Ashton-Tate Corp.

Ingres' Star comes closest to fully implementing the requirements in the list above. Its software optimization capability is especially noteworthy. Even as the functionality leader, however, Ingres does not provide full distributed functionality. For example, it does not support event alerters or distributed transactions over heterogeneous DBMSs.

Interbase provides a high level of true distributed DBMS functionality and is a good seller in the engineering workstation/Unix world. The software extends the relational model with additional functions such as extendable field types and event alerters. Ashton-Tate recently acquired vendor Interbase Software Corp. and its namesake product; therefore, it is likely there will be future Dbase/Interbase product integration.

Oracle Corp., the largest independent software DBMS vendor, has pursued high performance in its distributed strategy to date rather than adding relational functionality such as referential integrity or stored procedures.

In its distributed products, Oracle functionality is limited to reading, not updating, distributed data. As a server, Oracle supports only a rudimentary software optimizer.

Computer Associates International, Inc. also has a high-performance distributed implementation built on top of its proprietary Datacom product.

This distributed implementation isn't currently based on SQL, but as SQL becomes more fully implemented in the Datacom kernel, support for distributed Datacom SQL will become available.

**Limited use**

Because vendors have been taking the better part of a decade to deliver all of the pieces that constitute a true distributed DBMS, companies' use of true distributed DBMSs has been hindered.

In fact, of the 630,000 database systems in use at banks, financial institutions and insurance companies, 8,350 are considered client/server systems, while only 25 are true distributed DBMSs, according to a 1988 study by Business Research Group in Newton, Mass.

By 1993, those numbers are expected

to grow to 63,000 and 1,600, respectively.

If true distributed DBMS products are the Mercedes-Benzes, then client/server DBMS products are the Mazda Miatas — trim, nice looking and low-priced (savings come from computer cycles used and the ease with which they are installed and managed). By accepting some reduction in location transparency function, a user is able to use client/server technology to build a distributed computing environment that runs well with today's hardware and networks.

Client/server computing provides the industrial-strength security, integrity and database capabilities of minicomputer or mainframe architectures while allowing companies to build and run their applications on PCs, Apple Computer, Inc. Macintoshes or minicomputer networks. Unlike file-based network computing, client/server software provides secure multiuser concurrent access to shared databases. Furthermore, client/server DBMSs enable one application to connect to multiple database servers; however, not all client/server systems support this.

**Three components**

A client/server computing environment consists of three principal components: the client, the server and the network that connects the two (see chart at left for individual functions).

The application program runs on the client and may be written in a 3GL or 4GL. An emerging group of "Windows 4GLs" allows painting of applications under windows-based operating systems. Windows 4GLs support windows-oriented applications development and execution.

Powersoft's Powerbuilder, Ingres' Windows 4GL and Gupta Technologies, Inc.'s SQLwindows fall into this category. Using any of these application-building approaches results in a runtime configuration in which the I/O and application control come from the client, while the database and associated semantics run on the server.

The transaction capabilities of client/server software working with lower end PC servers or "superservers" — mini-computer-style cabinets built with microprocessors such as Intel Corp.'s i486 or Mips Computer Systems, Inc.'s R4000 — are astounding.

For example, on the low end of the hardware scale, Gupta's SQLbase and Microsoft Corp.'s SQL Server can both run on Intel 80386-based PCs processing approximately 10 TPC-A transactions per second. (A rate of 10 transactions per second is adequate to support 250 automated teller machines on a single server.)

PC hardware can support disks with 16-msec access times and 2M- to 3M-byte transfer rates. Such a machine can

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be configured with 300M bytes of memory for less than \$10,000.

However, companies need not relegate client/server DBMSs to the low end of the transaction processing spectrum, especially if they combine the DBMS with high-end super-servers from Solbourne Computer, Inc., Pyramid Technology Corp., Concurrent Computer Corp., Compaq Computer Corp., IBM or Digital Equipment Corp.

This high-end superserver hardware is typically going to be built with parallel Intel 80386, I486 and/or reduced instruction set computing chips from MIPS Computer Systems or Sun Microsystems, Inc.

**More for less**

Configurations consisting of a server with a multiprocessor design and an "open" operating system such as Unix, Banyan Systems, Inc.'s Virtual Networking Software, Microsoft's OS/2 or IBM's LAN Manager give users a machine with hundreds of millions of instructions per second of processing power and 250G bytes of disk data storage at a cost of less than \$500,000.

Combining this technology with small computer systems in-terface or other high-speed channels and a client/server

DBMS offers a configuration that can replace a \$14 million IBM System 3090 running DB2. That's a potential savings of up to 95%.

Companies must weigh IBM's DB2 and DEC's RDB sophisticated operating functions and utilities against the cost savings the combination of distributed DBMS, open systems and super-server technology can provide.

For high-performance computing and transaction processing in the Unix and DEC VAX markets, Sybase, Inc. is the current client/server DBMS leader. Although Sybase doesn't support location transparency, it is at the forefront of DBMS embedded stored procedures and open gateway technology — an important piece in heterogeneous DBMS computing.

Sybase and Microsoft have teamed up to provide the OS/2 market with a version of Sybase's SQL Server. The offering's functionality, however, is less than what Sybase provides on Unix and VAX platforms.

The functional gap between client/server and true distributed DBMS products is closing. Increasingly, client/server DBMSs will be able to support multiple

data servers and perform functions across those servers.

In fact, by the time true distributed DBMSs mature — about 1993 — the technical differences between client/server and true distributed DBMSs will likely have disappeared. This means users can have it their way, with either technology being a good choice for downsizing and distributing applications. ●

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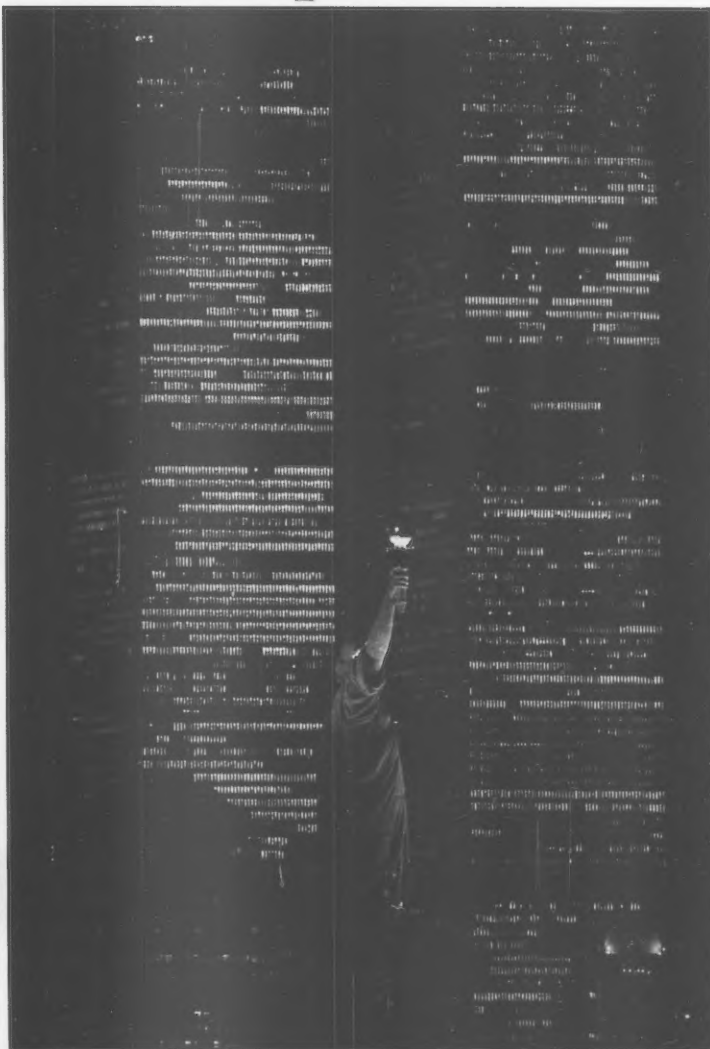
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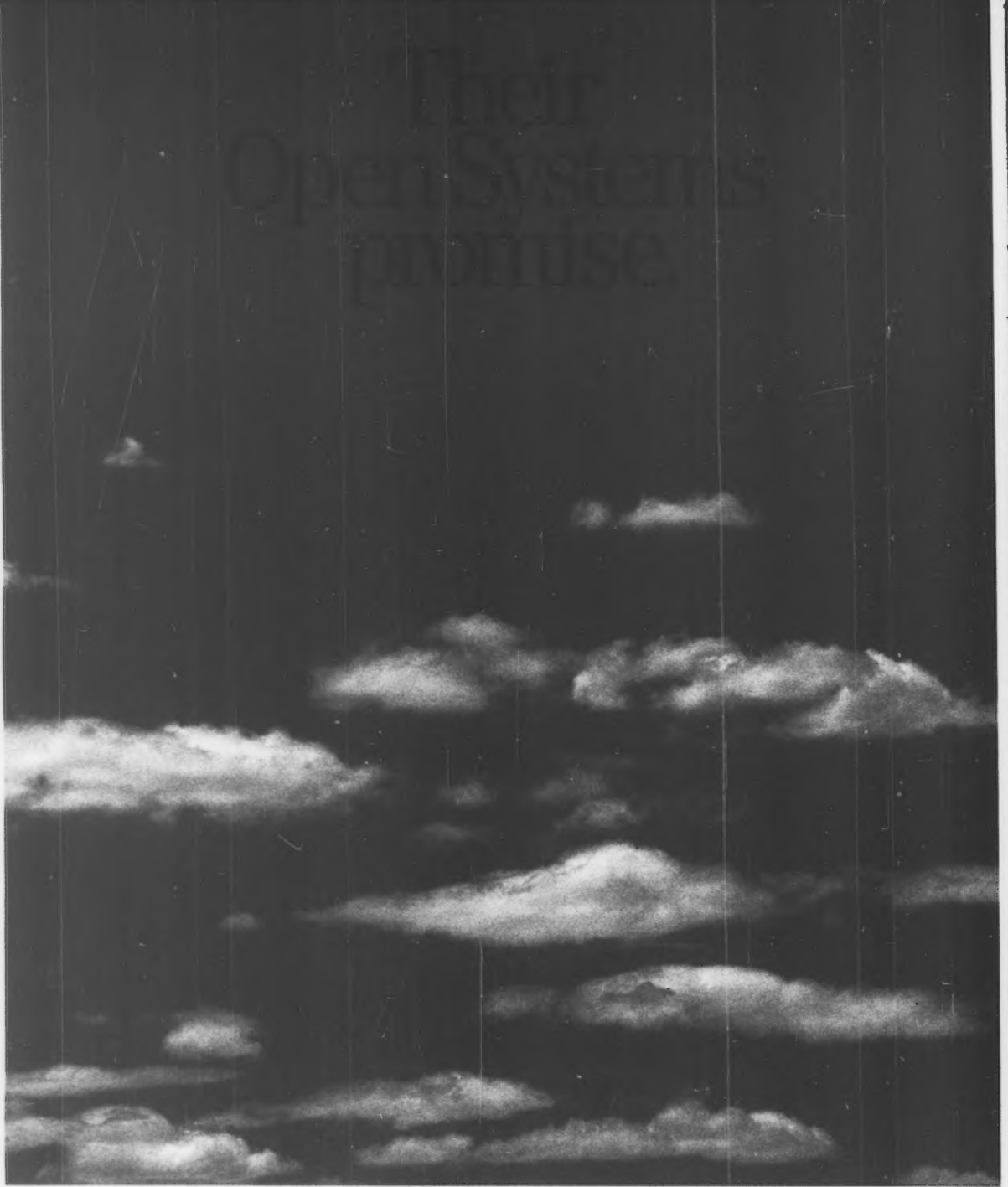
Distributed DBMS software, of which client/server DBMSs and true distributed DBMSs are a part, has to provide all the functionality of multiuser mainframe database software and allow the data in the database to exist on a number of different but physically connected computers.

Distributed DBMSs should have the following functions:

- Data integrity through automatically locking records and rolling back partially complete transactions.
- The ability to attack deadlocks, automatically recovering completed transactions in the event of system failure.
- The ability to optimize data access for a wide variety of application demands.
- Specialized I/O handling and space management techniques to ensure fast and stable transaction throughput.
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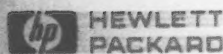
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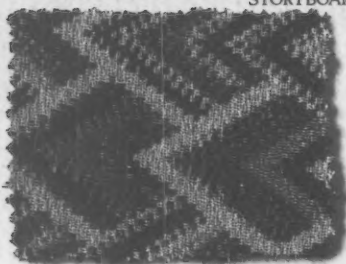
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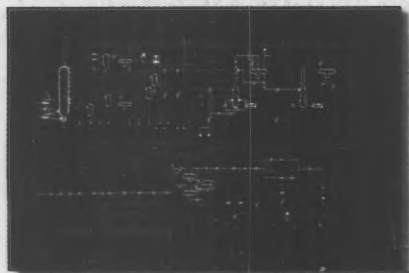
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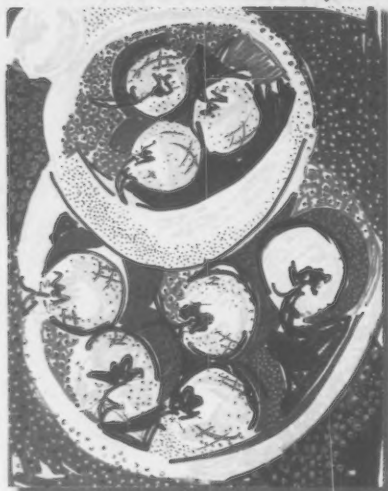
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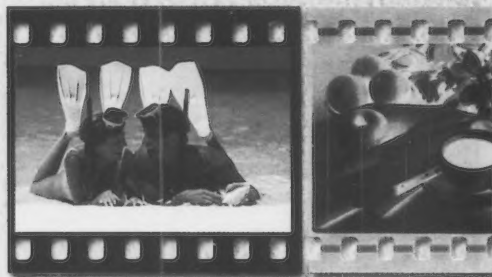
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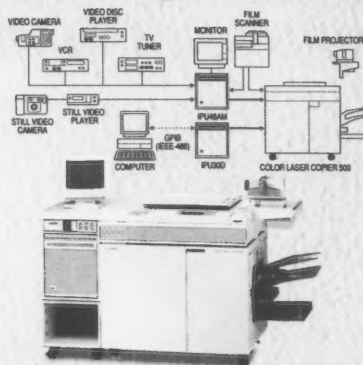
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# COMPUTER INDUSTRY

## NATIONAL BRIEFS

### First the good news

► Cherry Hill, N.J.-based wide-area network management systems provider **Infotron Systems Corp.** and Ottawa-based local-area network products vendor **Gandalf Technologies, Inc.** are poised for a stock swap merger aimed at offering users soup-to-nuts networking connectivity from a single source. Infotron's news that it had found the partner it recently said it was searching for coincided with its quarterly report of a \$33.3 million loss and revenue off 11% for 1990.

### Am I blue?

► We don't know — and won't know now until after the trial. When last seen, Northport, N.Y.-based **Big Blue Products, Inc.** — a six-person computer and software distributor — was battling IBM before the Trademark Trial and Appeal Board over which of the two had the superior right to the name "Big Blue." Last month, a panel of the board found a "genuine dispute of material fact" as to whether the public had come to identify the nickname with IBM before little Big Blue took it on in 1984; the board denied IBM's motion for summary judgment and set a series of trial dates. Stay tuned.

### The white stuff

► Within one month of posting its 119th consecutive quarter of double-digit profit increases, Roseland, N.J.-based **Automatic Data Processing, Inc.** paid an undisclosed amount of cash last week to acquire payroll services firm **Robert F. White & Co.** White currently serves some 13,000 companies in the Chicago, Milwaukee, Dallas and Miami areas.

### Elementary, my dear

► The quarter ended March 31 was kind to Mr. Watson's company — you know, the one with the three initials: **BMC.** A 116% growth rate in its DB2 product line helped fuel Sugar Land, Texas-based **BMC Software, Inc.** to fiscal fourth-quarter net income up 56% to \$9.9 million on revenue up 50% to \$43.5 million. Accountable for 15% of BMC's bottom line in 1990, DB2 products are currently kicking in 21% of the company's total revenue, according to Chief Executive Officer Max P. Watson.

## Index, Sage pool forces to take on CASE

BY ROSEMARY HAMILTON  
CW STAFF

In 1990, front-end computer-aided software engineering (CASE) pioneer **Index Technology Corp.** had big plans to expand its product line to all segments of the applications development life cycle. The Cambridge, Mass.-based company was reaching beyond its design tool business into re-engineering territory and spoke of a code generator under development.

Today, Index's wish to be a complete tool set provider is coming true, but not exactly in the way it had once planned.

Earlier this year, Index — a high-profile veteran of the CASE

tary products and was not driven by Index's financial condition.

### In the major league

The merger creates a \$75 million company, which, in the CASE market, is a big-time player. The combined user base will number about 100,000.

Between Index's flagship **Excelsior** design tool line and Sage's **APS** generator, **Intersolv's** product line addresses most of the CASE life cycle, including front-end design, re-engineering and code generation. Plus, the firm has a coveted alliance with IBM that makes it one of the key AD/Cycle inner circle members.

### In search of the perfect fit

Born of **Index Technology Corp.'s** merger with **Sage Software, Inc., Intersolv, Inc.** is starting out with a full suite of CASE offerings, a coveted IBM alliance and all the question marks that combinations bring

BENEFITS	CHALLENGES
<ul style="list-style-type: none"><li>• Highly competitive products</li><li>• Multitier marketing</li><li>• Support of LAN-based development</li><li>• Experienced management</li></ul>	<ul style="list-style-type: none"><li>• Strong Knowledgeware market position and momentum</li><li>• Successful introduction of Excelsior Series II</li><li>• Effective, timely integration of the merged organizations.</li></ul>

Source: Volpe, Welby & Co.

CW Chart: Doreen St. John

field — merged with Rockville, Md.-based back-end CASE vendor **Sage Software, Inc.** to become a new entity: **Intersolv, Inc.** The merger announcement came in late 1990, when Index was preparing to announce an annual loss.

However, **Intersolv** executives insist the deal simply joins two companies with complemen-

This relationship, developed specifically around **AD/Cycle**, goes well beyond IBM's traditional marketing partnerships.

"**Knowledgeware** was overwhelming the industry with its marketing and sales, and that's not healthy," said **Aaron Zornes**, a vice president at **Meta Group, Inc.** "I think the merger is very important for the health of the

industry," he added.

As separate companies, the picture was not so rosy, particularly for **Index**. Although the firm had a well-established reputation in the CASE market, it started to lose ground last year. **Knowledgeware, Inc.**, which belonged to the **IBM AD/Cycle** core group along with **Index**, was emerging as the dominant player in the

**IBM CASE** market.

Although **Knowledgeware** announced an **IBM OS/2**-based product at the end of 1990, **Index** was unable to do so. **Index** spoke of a March 1991 date for shipment of an **OS/2**-based version of **Excelsior**. **Intersolv** executives now say that target date was only for a beta-test re-

Continued on page 91

## IBM's Akers points up long-term strategy

BY NELL MARGOLIS  
CW STAFF

**KANSAS CITY, Mo.** — **IBM** is learning what the Boy Scouts have always known: When it comes to creeds, you can't beat "Be prepared."

"While we cannot control recessions or international conflicts or volatile currencies," Chairman **John Akers** told the 1,100 stockholders who gathered here for the firm's annual meeting last week, "we can control how well we manage our business."

The extent to which **IBM** has

done just that, **Akers** said, positions the firm for a swift, sure and sustainable surge ahead as soon as the recession lifts.

Many analysts agreed. To gauge how well a company is likely to emerge from the recession, **S. G. Warburg** analyst **David Wu** said, "look at its condition on the way in." On the eve of the recession, **IBM** batted in impressive 1990 bottom lines.

In addition, **Akers** noted, hefty investments — \$30 billion in research and development over the past five years and \$1 billion annually in education and training — will leave **IBM** with "a

strong hand to play" across all product lines once the economic situation starts to improve.

Corporate efficiency initiatives will have pared some 50,000 employees, 70,000 staff positions, 8,000 managerial jobs and three management layers from the firm's profile by the end of this year, **Akers** said. These numbers include 14,000 employees **IBM** expects to eliminate during the current year without layoffs and without cutting into the meat of any firm operations, **Akers** noted.

He also underlined focus on customer satisfaction as **IBM's** once and future corporate commitment and commercial ace. "We're not there yet," **Akers**

said, "but we're seeing the results in tangible ways."

According to **Norman Vincent**, vice president of data processing at **Bloomington, Ill.-based State Farm Mutual Automobile Insurance Co.**, this is no idle boast. For the past two years, the insurance company and **IBM** have been working together to tailor mainframes and **Personal System/2** machines into a system aimed at automating **State Farm's** independent agencies.

"Everything we've gotten has been of the highest quality," **Vincent** said, "and **IBM** has delivered it all on time — or early."

A proposal to withdraw operations from **South Africa** was defeated at the meeting.

## Blend of old and new

In legal terms, the deal between **Index** and **Sage** is a merger. Company officials point to the new name as the most obvious symbol that this is not a takeover story.

Nonetheless, **Kevin Burns**, who was in charge at **Sage**, will head up the new organization. **Intersolv** will also keep the former **Sage** corporate headquarters location in **Rockville, Md.** **Richard Carpenter**, **Index's** former chief executive officer, will serve as vice chairman at **Intersolv**. **Fred Luconi**, who had been president of **Index**, will not be working at the new firm.

Company officials said the merger is an idea that was brewing for some time. According to **Burns**, he and **Carpenter** would chat about the market "over a cup of coffee" from time to time. In 1990, both expressed their desires to become a "one-stop shopping" tools provider, and the idea of a merger crystallized.

"There's no question the merger was a shift from doing it on our own," **Carpenter** said. "I think that what happens is [that] on any path you are pursuing, you always look to alternatives. If you see an option that gets you better long-term results and gets you where you want to get to, you evaluate that in parallel with what you're doing."

"[**Index**] had a large expense base toward the latter half of 1990, but there was also the promise of a whole new revenue stream," **Carpenter** said. "You had to weigh that against the alternatives. It was certainly part of our thinking. The combination of the merger and the new identity made more sense."

ROSEMARY HAMILTON



# Group urges end of encryption export ban

BY GARY H. ANTHES  
C.W. STAFF

WASHINGTON, D.C. — A federal ban on the export of computer products able to encrypt data is increasingly harmful to users and vendors and useless in safeguarding national security, industry representatives who met here recently said.

Officials from computer firms told the U.S. Department of Commerce's Computer Systems Technical Advisory Committee (CSTAC) that the ban harms U.S. industry by leading overseas customers to choose products from countries without such restrictions. This hurts some

U.S. suppliers by forcing them to develop and support two versions of products, one for domestic use and one for export.

The vendors also said the problem trickles down to users, who face product introduction delays, higher prices or poorer security, depending on how the vendor reacts to the export regulations.

Adding insult to injury, most acknowledge, the export restriction does little to keep encryption capabilities out of the hands of those on whom U.S. intelligence agencies would like to spy. The two most common encryption algorithms are available from libraries and bulletin boards, and hardware and software implementa-

tions are widely available from foreign sources. "The horse is out of the barn, guys," said Stephen T. Walker, president of Glenwood, Md.-based Trusted Information Systems, Inc. "We're hurting ourselves in some fundamental ways."

CSTAC — 48 officials from government and industry — has recommended that mass-produced software, with or without encryption, be completely freed from export regulations. That move would have to be approved by the U.S. Departments of Commerce, State and Defense and possibly by the National Security Council. But the agencies disagree about how far to go in decontrolling soft-

ware, and officials from the Commerce and State Departments attending the CSTAC meeting publicly clashed over which agency has jurisdiction over encryption exports.

The State Department, acting with the guidance of the National Security Agency (NSA), will not allow export of computer products that encrypt data using the federal government's Data Encryption Standard (DES) algorithm or the widely used RSA method available in the U.S. from RSA Data Security, Inc. Products that encrypt only passwords can go overseas with few restrictions.

"You can buy DES chips outside the U.S. and you can buy them in the U.S., but you can't export a U.S. product with a DES chip in it," Walker said. "And you can't export RSA, but RSA is in use all over the place in Europe."

CSTAC Co-chairman James E. Schlaeppli, a trade official at Control Data Corp., said industry is partly to blame for the impasse. "The only comment we've had from industry is that [the export ban] is stupid," he said. "We agree."

Schlaeppli said CDC lost a big contract for computer terminals and software for the Irish Sweepstakes because the company was not allowed to export gear with the security features needed.

Microsoft Corp. sees rapidly growing demand for better security coming from users in the U.S. and abroad, and the company wants to include encryption capabilities in all 45 of its products.

According to Sam Jadallah, district manager of Microsoft Federal Systems, Microsoft could develop dual versions of the products, at a cost of millions of dollars, but the domestic versions with the better security would be illegally shipped overseas as fast as they were introduced. "We couldn't even compete with our own pirates," he said.



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## Tales from the crypt

Only a few companies, such as Microsoft, can afford staffs of lawyers to untie the Gordian knot of export controls. HDC Computer Corp. in Redmond, Wash., makes personal computer utilities. It had one with a DES file-encryption option ready to ship when it learned that the NSA would not allow the product out of the U.S. "We were completely surprised," said Joan Bateman, director of international operations at the firm.

After ample discussion with the NSA, HDC stripped out DES, added a less secure encryption method blessed by the NSA and now has an exportable version of the utility. Bateman declined to estimate the cost of the modifications to software, documentation and packaging.

She said there is also an intangible cost associated with the dissatisfaction of customers outside the U.S. who are told they may not buy the best the firm has to offer. "The lessons learned from this will make us think twice about adding encryption to future products," she said.

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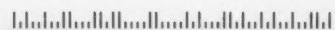


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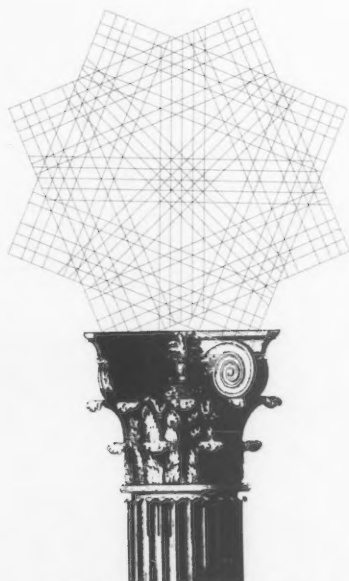




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EXECUTIVE CORNER

# Adviseurs names subsidiary president



**John Z. Dorn** is the first president of New York-based **Adviseurs, Inc.** The new North American subsidiary of Paris-based information data center decision sup-

port systems vendor **Adviseurs, SA** opened its doors in March.

Dorn has served the technology industry as a management consultant for major national and international firms for the past 14 years.

Former Texas Instruments, Inc. Information Technology Group Vice President **Kenneth V. Spenser** is at a new post: president and chief executive officer of Novi, Mich.-based **Micro Engineering Solutions, Inc.**

The firm, a computer-aided design and manufacturing tool vendor, was acquired last May by a venture capital consortium that launched an extensive executive search as part of its acquisition game plan. Spenser replaced interim general manager **William Parker**, who helped coordinate the acquisition and will now join the executive team.

**Nick Copping** was named president and CEO of Sunnyvale, Calif.-based software development firm **Atherton Technology**. Copping, 41, joined Atherton in 1989 from **Hewlett-Packard Co.**, where he headed the company's advanced laboratories for future-generation software development. Formerly Atherton's vice president of technical services, Copping succeeds **Arthur G. Goldberg**, who has left the firm.

**Arthur Carr**, who became acting president and CEO of **Bytex Corp.** in January following the resignation of **Jeffrey S. Goodman**, is not "acting" anymore. Carr — a computer industry veteran who, among other achievements, co-founded **Stellar** (now **Stardent**) **Computer, Inc.** — was recently elected president and CEO of Bytex, as well as a member of the board of directors.

**Ronald Cornell** has been promoted to president and CEO of Fremont, Calif.-based image processing hardware and software vendor **Vicom Systems, Inc.**

In a related move, former **Vicom** President and CEO **Al Winegar** assumed the office of chairman of the board.

**S/Cubed, Inc.**, a Stamford, Conn.-based start-up formed to create and market application development products beginning with a personal computer-based expert system trained to produce information systems, has selected a president to spearhead the effort: **John Rade**, former head of **Information Science, Inc.** Prior to his stint at Information Science, where he presided over a large-scale corporate restructuring, Rade was with European software and services firm **Cap Gemini Sogeti**.

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## Index

CONTINUED FROM PAGE 87

lease. They also say they now expect to deliver the product by year's end.

With the merger, Index "gets a second chance," according to Vaughan Merlyn, a partner at the Boston-based Ernst & Young Center for Information Technology and Strategy. "They had established the [design and analysis] market, but then others started stealing their market share," Merlyn said. "Then, the financial situation had weakened them to the point where they weren't going to easily make it by themselves," he added.

Sage, meanwhile, maintained a solid reputation with its code generator but was not perceived as a core CASE tools vendor, in part because it was not closely associated with IBM's AD/Cycle. By combining forces, the two companies have the chance both to fix their individual problems and to focus on their common goal of providing a full set of tools, analysts said.

Intersolv also intends to promote a less rigid approach to CASE, which could appeal to users who have been struggling with the strict methods some tools impose. Kevin Burns, Intersolv's chief executive officer, said the strategy calls for tools that are flexible enough to accommodate different methodologies. This reflects a CASE approach that Index promoted with Excelerator. The design tool could be tailored to different methodologies, including information engineering.

"It has to be flexible enough to be configured to the different cultural and project requirements," Burns said. "The premise [espoused by] our competitors holds that the reverse is true."

The biggest challenge for the new Intersolv will be integrating the product line, analysts said.

"They have to smash their product lines together, by either integrating them or coming out with a new product line," Merlyn said. "They have some technological challenges, and they are nontrivial. It will be tough."

A second challenge springs from the IBM relationship. While it will no doubt give Intersolv a marketing boost, it will also place the company in the strange position of simultaneously being IBM's partner and competitor. The AD/Cycle agreement covers some Intersolv products; however, it excludes the company's applications generator because IBM is determined to make its own generator, Cross System Product, a success.

"The customer should decide," Burns said. "There will be times when [Cross System Product] is right, and at other times, [Intersolv's] APS will be right for the requirements."

At the same time, Burns said, he expects the IBM relationship to open doors. "We are targeting MIS development, and that's largely an IBM world," he explained.

While some analysts said Index could be overshadowed by Sage in the new company, they also said the end result will be a stronger company overall. In fact, one of the new company's first official moves was a layoff of 150 people and a \$20 million charge against earnings for the fourth quarter, ended last month.

"They had too many people," said Paul Bloom, an analyst at San Francisco-based Volpe, Welty & Co. "It was a powerful move and a necessary consequence of the transaction."

## INTERNATIONAL BRIEFS

### One Europe? Maybe not yet

► European computer manufacturers met secretly in France last month to try to persuade the European Commission to give them breathing space in which to muster their forces against foreign competition. However, demands presented to European Commission President Jacques Delors came in several accents, according to a report in the British business press. Olivetti head Carlo de Benedetti and Philips N.V. Chairman Jan Timmer argued for the

commission to act against nationalistic purchasing policies, which is in line with the commission's long-term goals, while French delegates Alain Gomez of SGS-Thomson and Francis Lorentz of Groupe Bull want the commission to turn a blind eye to state subsidies for struggling national suppliers, the report said. Some manufacturers also urged stronger antidumping measures, while all wanted a delay in the implementation of tough new antitrust laws.

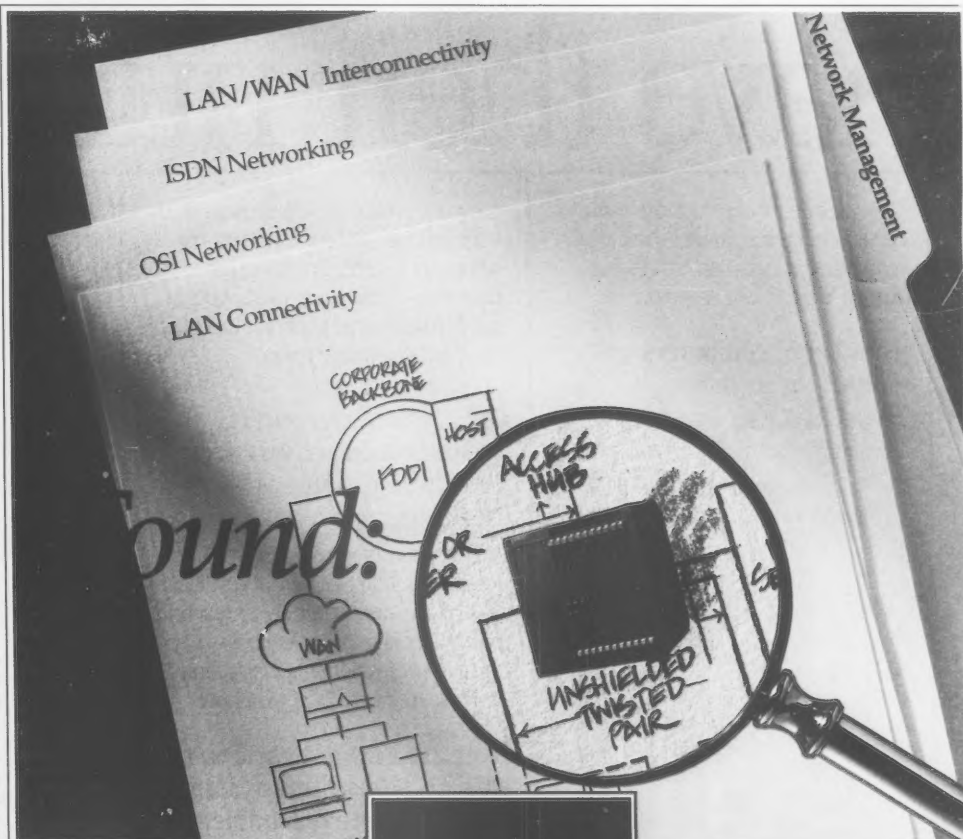
### Big Blue rising sun

► IBM will supply the technology underlying its 9121 mainframe as well as its MVS/ESA operating system to Japanese giant Mitsubishi Electric Corp. to use

as its future top-of-the-line system, to be known as the Melcom 900, both companies said late last month. IBM subsidiary IBM Japan will supply the technologies to Mitsubishi, which currently commands a scant 2% to 5% of the Japanese mainframe market.

### Northern lights

► Oslo-based storage and display vendor Tandberg Data posted pretax profits of \$2 million for its first six months of fiscal year 1990-1991, up from a \$350,000 loss in last year's first half. Revenue for the period climbed 62% to \$78 million. President Arne Ramstad credited the healthy developments to "hard work over a long period of time."



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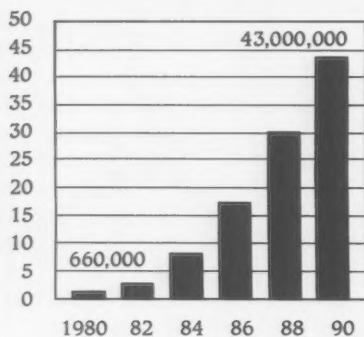
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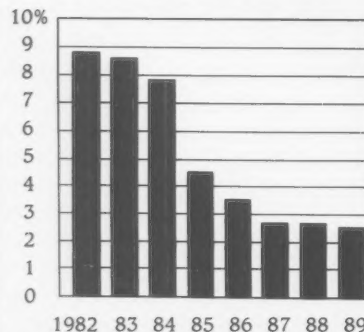
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# COMPUTER CAREERS

## MBA good choice to broaden marketability

Fast Track is a monthly column dedicated to answering questions on career directions.

BY MAX MESSMER  
SPECIAL TO CW

**Q** I am 34 years old with nine years' experience as a business programmer/analyst in IBM mainframe shops. I hold a bachelor's degree in information systems. I'm considering returning to school to complete a master's. Does it make more sense for me to pursue an M.S. in computer science or an MBA?

**A** Companies today are looking for both technical and business skills and experience. Your experience and your undergraduate degrees are technical, so an additional technical degree is unlikely to broaden your opportunities as much as some background in marketing and finance.

An M.S. degree would be desirable if you wish to work for an engineering-oriented company, but an MBA is a better choice for general career marketability.

**Q** I am a Canadian citizen with 23 years of information systems experience. How could I go about obtaining a position in the Tampa, Fla., area? Under the Free Trade Act, my citizenship

should not be a difficulty, but most of the companies I've contacted refuse to consider my application.

**A** When several equally qualified candidates are available, employers favor those who live in their geographic area. A local person's acclimation is easier, and relocation costs are not a factor. In addition, visas for people with a professional background and education are usually obtainable, but they can take several months, and many employers are unfamiliar with the process.

If relocation is a priority, you could consider a position elsewhere in the U.S. (closer to the Canadian border where businesses are more accustomed to dealing with visas) that offers an opportunity to transfer to Florida during a subsequent job change.

Your best luck might be at software development and consulting firms with offices in both countries.

**Q** I am a vice president at a Fortune 100 company. I have 20 years of information systems experience ranging from personal computers to mainframes and everything in between. I would like to make a mid-career change to teaching, either secondary education or college. Where do I start?

**A** Many areas have a shortage of teachers with experience in applied computer fundamentals. So as long as you are open to a possible reduction in salary, you should be able to find employ-

positions, I'm generally only offered entry-level ones. Employers assume they can pay me a lower salary than they would an older person with my experience. Further, they assume I can handle later hours and heavier work loads because I'm young. How can I help make people respect me for my skills, instead of taking me for granted?

**A** Start by taking a careful look at how you are presenting yourself to employers. If your resume indicates the same chronology of experience that you describe, you probably are not packaging yourself well.

Begin by taking a closer look at your resume. Put yourself in the eyes of an employer and look for anything that might cause him to view you as an entry-level person. You should be emphasizing the results you have achieved for your employers, your progressively increasing responsibilities and your technical and managerial skills.

You might also consider whether you are projecting the most professional image possible during interviews and in your daily work. Rehearse your interview technique with a mentor, or seek

advice from your peers and from a professional recruiter.

**Q** I've been looking for a career overseas, preferably in Europe, without success. I'm currently a project leader with 4½ years' experience. How might I improve my chances?

**A** While the elimination of many trade barriers in 1992 is expected to trigger strong growth in Europe, some European countries are experiencing the same economic softness as the U.S. right now. Your search should emphasize areas such as western Germany, where the demand for people is stronger.

The most common overseas assignments are within multinational and public accounting firms with overseas branches. These firms take stateside applications.

Messmer is chairman of Robert Half International, Inc., which places permanent and temporary IS professionals in the U.S. and abroad.

We welcome your questions. Send them to Cathy Duffy, Careers Fast Track, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701, or fax them to (508) 875-8931. Letters may be edited for brevity and clarity. Your initials and town will be printed unless you request otherwise.

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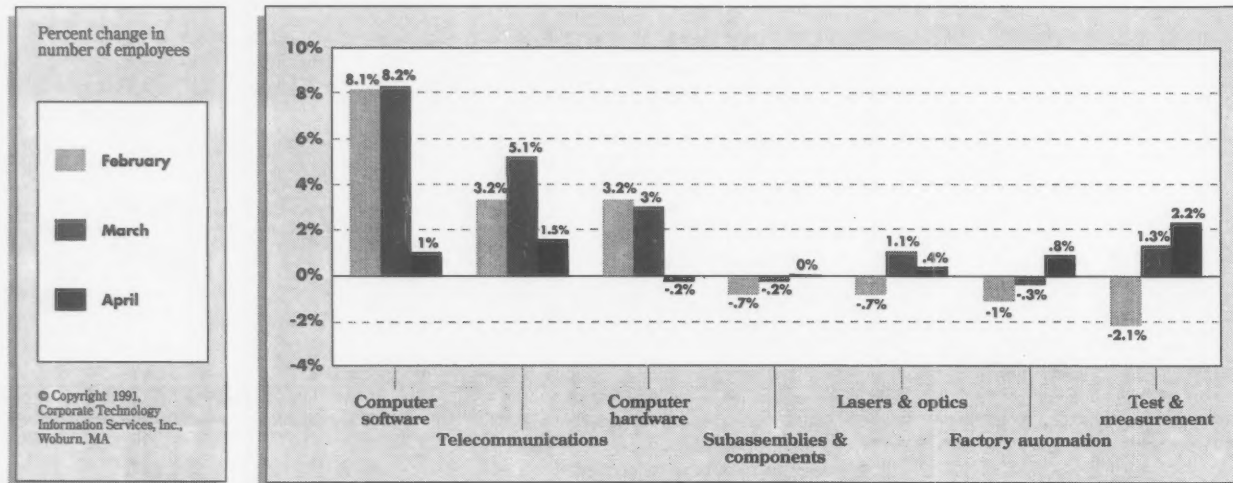
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## Computerworld/CorpTech Career Index

**INFORMATION TECHNOLOGY COMPANIES** — Employment growth in small- and medium-sized computer software companies slowed in April, while employment growth in test and measurement companies advanced, based on a survey of 2, 473 technology manufacturers



Percent change in number of employees

February  
March  
April

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In this role, you will be responsible for analysis, project tracking, and project lead duties. This will involve requirements definition; system design; program/job specification creation; personnel/hour estimates; program monitoring; and administration of work assignments. Requirements include 3-4 years' programming experience, preferably within a large IBM mainframe shop, and excellent analytical, communication, and leadership skills. A working knowledge of IBM/COBOL/JCL/130/IMS/Assembler desirable; experience with Cybertek CK-4 strongly preferred.

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Your duties will be varied, and will include debugging, technical consulting, design support, and other independent projects related to improving the IMS environment. Excellent communication skills and a strong customer service orientation are essential to this position, as you will be working with all levels of users. Your superior technical ability, including an in-depth knowledge of IMS database functions, should be complemented by a sense of initiative.

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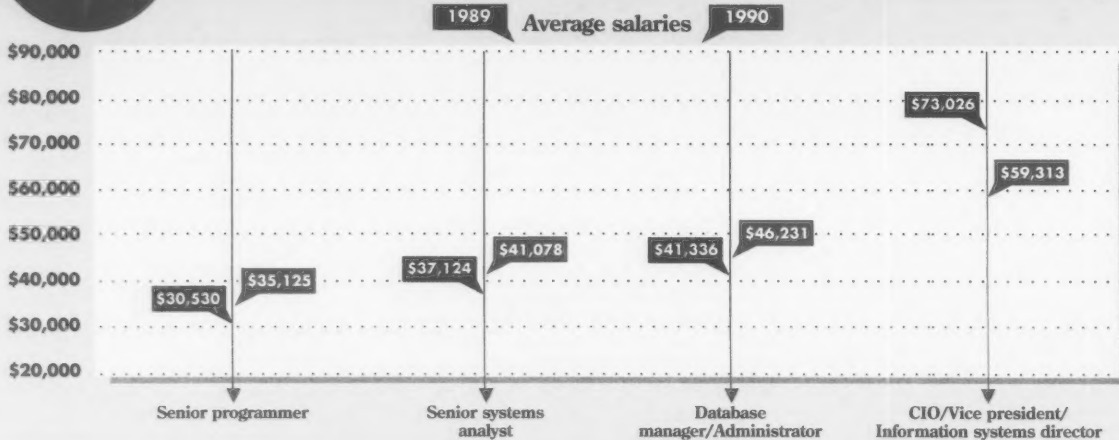
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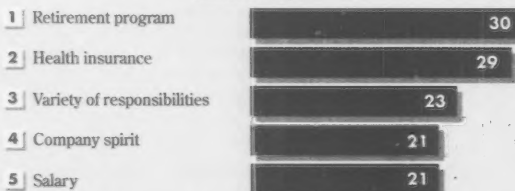
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\*Base of 59; multiple responses allowed

**What are the biggest frustrations of working in IS in the education field? (Top three responses)**



\*Base of 59; multiple responses allowed

Source: Computerworld salary and job satisfaction surveys

CW Chart: Tom Monahan Illustration: David Flaherty

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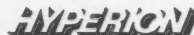
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# MARKETPLACE

## Warranties: An ounce of prevention . . .

Legal eye is a monthly column exploring legal issues and their impact on information systems.

BY JOEL B. GILMAN  
SPECIAL TO CW

**Y**ou would expect an information systems professional buying a half-million dollar computer system to spend at least as much time reviewing the paperwork as someone spending half that much money on a new home would. Unfortunately, all too many IS organizations fail to study systems purchase and support agreements to make sure they are adequately protected against failures.

Whether IS managers deal with a value-added reseller, a dealer, a single large vendor or many little vendors, they should carefully review sales contracts to understand what promises are made therein. They may be surprised to discover that the contracts promise very little.

A seller's contractual pledges regarding the quality and performance of systems and support services are called "warranties," which may be expressed verbally or in writing or be implied by law.

For example, when an IS buyer purchases tangible goods such

as hardware or off-the-shelf software, the Uniform Commercial Code implies a warranty that requires them to be adequate for normally intended uses and to meet or exceed the customary quality of similar goods.

The exact implications of these warranties with respect to a specific product aren't always clear, so buyers will invariably see a bold-faced "DISCLAIMER OF IMPLIED WARRANTIES" in virtually every computer contract they ever read. Although many vendors will provide some sort of protection in lieu of the implied warranties, few vendors are willing to risk liability for failure to meet the vague standards of these implied warranties.

### Basic protection

A vendor cannot simply disclaim warranties of quality or performance. Most states recognize a doctrine known as "failure of essential purpose." For example, if a buyer signs a contract for the purchase of a widget and the vendor refuses to warrant that it is even a widget, the doctrine of failure of essential purpose says the warranty disclaimer is invalid. In other words, the vendor has to offer some sort of assurance that buyers will in fact get what they are paying for.

These implied warranties do not apply to a contract for services, however. Usually, a consultant is held only to a requirement that his work will be performed competently, consistent with standard industry practices. This has little meaning in the context of computer consultants, unfortunately. Although there are many extremely competent and professional consultants, the industry as a whole has yet to evolve a clear definition of its "standard practices."

The following are some of the more important warranties IS professionals should have written into final purchase agreements:

- **Functions:** When acquiring a database management system, for example, be sure the contract spells out in detail as many attributes as are known at the time the deal closes, such as table and record parameters, number and design of input screens, specifications for reports and functions and data flow between screens, tables and reports.

Often, such detailed information won't be available until after

a prototype is built, so consider having a separate pilot project to develop a prototype before going into a more costly full-development agreement.

- **System response time:** This is becoming less important with high-speed, decentralized, networked microcomputers. However, in some applications, this might be a critical feature and should be included in the seller's warranty.

- **Support response time:** If a computer goes down halfway through the year-end accounting, how long will it take the vendor to get the system up and running again? This is not always a critical factor for every system, but more often than not, the buyer risks severe havoc to his business if he can't be assured of a minimum response time.

- **Runtime environment:** The sales literature says the software "runs under Unix," but which flavor of Unix and which hardware implementation? Great strides have been made toward standardizing the Unix application interface, but a buyer never really knows until he runs a given

application on his specific hardware configuration. When acquiring new software to run on existing hardware or in conjunction with existing software, insist on a trial period long enough to thoroughly test the software — typically 30 days.

- **Training:** Let's face it. People in a busy organization simply do not have time to learn a new system by reading the manuals — no matter what the seller tells you. Have the seller document the availability and cost of training programs, whether or not the seller actually does the training.

Once the deal is on the table and the sales representative is waiting for the buyer to sign a preprinted form contract, it may not be easy to have such items included in the final agreement.

However, one way for a buyer to get the protection he needs is to incorporate warranties into the initial request for proposal. By doing so, the buyer puts all potential vendors on notice that he expects to have these matters addressed in the final deal.

Vendors may balk at these requests, but the IS buyer owes it to himself and his company to be sure he gets exactly what he pays for. Written warranties are the only way to do this when buying something as complex as a computer system.

Gilman is an attorney in Seattle who practices in the field of computer law.



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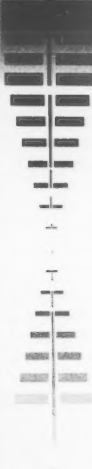
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# EDUCATION & TRAINING

## Instructors adapt to downsized companies

BY SUZANNE WEIXEL  
SPECIAL TO CW

Picking up the pieces in the aftermath of a corporate downsizing isn't easy for any department at any company. But for trainers, downsizing is particularly hard: There are fewer dollars to work with and even more training to deliver.

Ideally, trainers say, the challenges faced in a downsized environment should not be any different from those faced before the change. But in reality, downsizing impacts training in many ways.

Specifically, trainers must contend with changes in the kind of training employees require, smaller training budgets, fewer trainers and general confusion in the wake of the cuts.

However, trainers recommend the following ways to get around these obstacles:

- Perform needs analyses to assess the new skills required by workers.
- Learn to understand the

changing training needs from the beginning of the downsizing so training won't be forgotten in the budget.

- Rethink in-house and off-site training strategies.
- Customize in-house training.
- Develop information systems and training links.

### Meet needs

Immediately after Englewood, Colo.-based US West's Management Information Services Division downsized in 1990, training coordinator Angela Waller conducted a needs assessment that determined what users wanted to learn and how they wanted to learn it.

For instance, Waller explains, if a layer of management disappears, support staff may need to learn Lotus Development Corp.'s 1-2-3, and executives may suddenly find themselves doing their own word processing when support staff members are eliminated. Some people may be willing to sit in a classroom for a few days; others may want to take a self-study approach to save time.

Discovering where such shifts occur and how the training group can best support them is vital.

Needs assessment surveys are also instrumental in justifying training costs to line managers. If a trainer points out areas in which a company cannot afford losses in productivity, managers will more likely build training costs into their budgets, says John Bruce, vice president of Ameritech Bell Group in Schaumburg, Ill., which is currently in the throes of a major data center consolidation.

Trainers are also adjusting their training formats to deal with shrinking budgets.

At Ameritech, Bruce says, the priority of training needs as well as the resources available help determine which courses are handled internally and which ones are handled externally. It makes the most sense to offer the highest volume training, such as specific computer language skills, in-house, he says. Almost all end-user computing, however, is now contracted to outside sources. "As recently as last year, we did it in-house. Now we

have to commit our staff resources elsewhere where the need is greatest," Bruce says.

McDonnell Douglas Aerospace Information Services in St. Louis has found a way to squeeze more value out of sending employees off-site for courses, according to David Borlin, director of central computing services.

"We may send one or two people, where before we'd send everyone," he says. When those one or two come back, they pass on what they have learned to the rest. "We're learning to work smarter," he adds.

Customization is another driving force in helping

trainers cut costs and save time. In-house training can be adapted to suit specific applications requirements, which makes it more cost-effective and more precise, according to Borlin.

Courses at MCI Communications Corp. were designed as modules so that in addition to being focused on a specific application, they can also be focused on a specific project team, says Patty Flaherty, senior manager of systems engineering training.

For instance, a project team

coming in to study analysis techniques can use its own analysis documents, work on its own deliverables and come out with a gain in productivity as well as a gain in knowledge, according to Flaherty. If employees only need to study a section of analysis, such as business event modeling, they don't have to sit through a five-day course. MCI will provide just the section on business event modeling. If employees need the whole course but can't invest an entire workweek, they can meet one day per week for five weeks or half a day per week for 10 weeks. "We can eliminate extra, general-audience material, and there's no wasted time," Flaherty says.

In a twist on providing training in-house, US West — faced with fewer dollars to spend on outside sources and fewer trainers available in-house — turned to IS employees for help. According to Waller, the IS professionals were willing and able to conduct training sessions. Trainers still design and plan the courses, but Waller has found that the people who use the technologies every day understand how they work and how they fit into the local environment.

Weixel is a free-lance writer based in Framingham, Mass.



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# INDUSTRY ALMANAC

## RECOMMENDATION CHANGES

**DOWNGRADED FROM HOLD TO SELL:** Compaq Computer Corp. (Prudential Securities, Inc.). Reason: Lagging international sales pulled down first-quarter financials; no quick turnaround in overseas business expected; company continues to lose market share to second-tier personal computer clone makers including AST Research, Inc. and Dell Computer Corp.

**UPGRADED FROM HOLD TO BUY:** Symbol Technologies, Inc. (Prudential). Reason: A 38% increase in revenue boosted first-quarter results; large laser scanner orders from J. C. Penney Co. and United Parcel Service placed during the first quarter will also bolster second-quarter sales.

**UPGRADED FROM AVOID TO HOLD:** Advanced Micro Devices, Inc. (Bear, Stearns & Co.). Reason: Company has made impressive turnaround after three quarters of losses; projects it will sell more than \$100 million worth of its AM386-based products this year.

**UPGRADED FROM HOLD TO BUY:** Teradata Corp. (Prudential). Reason: Although most recent quarterly results fell short of estimates and may contribute to a short-term stock slide, firm has controlled expenses, and retailing and telecom businesses are strong; share price should climb into the mid- to high-\$20 range within the next 12 months.

## ANALYSIS IN BRIEF

**Microsoft Corp.** will not usurp Novell, Inc.'s networking market dominance in the near future. Novell's Netware dominates the local-area network operating system business almost as completely as DOS rules the desktop. Providing that it is not swallowed by a larger predator, Novell will remain the biggest fish in the network pond, owning half of the 12 million network nodes that will be installed in the U.S. during the next four years.

Customers who have invested in Netware and the training needed to learn it are not likely to switch without good reason. The company grew cash reserves by 83% to \$173 million last year while virtually eliminating long-term debt. With financial strength comes the freedom not only to continue high research and development spending — currently \$80 million per year — but also to acquire technology it can't easily develop internally.

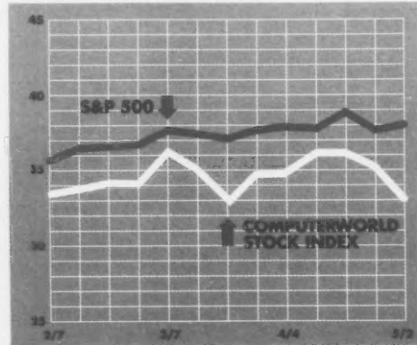
## Not all rosy

Microsoft's unique networking strengths — DOS and Windows on the desktop and OS/2 on the server — position it to control both ends of the client/server scheme that is coming into vogue. Novell, meanwhile, must evolve from simple file- and print-server networks to the client/server architecture. It also must get more developers to write applications for Netware, and it must stake out leading positions in network management, electronic mail, database applications and directory services.

Novell knows this and is working on a messaging engine that will pull together four key E-mail standards. Also, it is handling future development of a message handling service, a major E-mail protocol. Network management and directory services are reportedly getting a lot of Novell attention. Furthermore, Novell plans to bring Netware clients and servers under Netview, IBM's network management product. — *On the Line, Technology Partners, April 22, 1991.*

KIM S. NASH

## STOCK TRADING INDEX



## THIS WEEK'S HIGHLIGHTS

- Quarterly results continued to rock stocks. Apple Computer, Inc. warned of an impending profit decline for the quarter; its shares plummeted 9½ points last week, closing Thursday at 49.
- Seagate Technology, Inc. sank 1½ points to 11½. Bear, Stearns & Co. recently downgraded the stock from Hold to Avoid, citing lower-than-expected earnings for the quarter just reported and concerns about lower profit margins in the low end of the product line. Rival Conner Peripherals, Inc. lost 1½ points, closing at 24½.
- Chips and Technologies, Inc. slipped ¼ of a point to 9½ after recently issuing disappointing profits for the third quarter. Motorola, Inc. tumbled 2½ points to 63½, and Texas Instruments, Inc. lost 2½ points to 39½.
- Both NCR Corp. and AT&T stumbled ¼ of a notch last week as they trudged further through merger talks. NCR closed Thursday at 103½ while AT&T fell to 37½ points.

# Computerworld Stock Trading Index

CLOSING PRICES THURSDAY, MAY 2, 1991

TOP PERCENT GAINERS			TOP PERCENT LOSERS			TOP DOLLAR GAINERS			TOP DOLLAR LOSERS		
Stock	52-Week High	Change	Stock	52-Week High	Change	Stock	52-Week High	Change	Stock	52-Week High	Change
Alliant Computer Sys.	50.00	+29.31	Quantum Corp.	42.63	-16.42	Legent Corp.	3.38	+3.00	Apple Computer Inc.	3.00	-9.63
System Center Inc.	29.31	+18.17	AT&T	37.38	-1.64	Matsushita Electronics	3.00	+2.75	Borland Int'l	5.50	-5.50
MAI Systems Corp.	18.17	+15.15	Commodore Int'l	15.86	-5.38	Policy Management Sys.	2.75	+2.13	Hewlett Packard Co.	5.38	-5.38
Advanced Micro Devices	15.15	+14.29	Micrograph	14.94	-14.18	System Center Inc.	2.13	+2.00	Sequent Computer Sys.	14.18	-4.75
Microcom Inc.	14.29										

TOP PERCENT GAINERS			TOP PERCENT LOSERS		
Stock	52-Week High	Change	Stock	52-Week High	Change
3COM Corp.	8.50	+0.38	AT&T	37.38	-1.64
American Info Technics Corp.	63.75	+0.38	Commodore Int'l	15.86	-5.38
AT&T	37.38	-1.64	Micrograph	14.94	-14.18
Artel Communication Corp.	2.00	0.00			
Bell Atlantic Corp.	48.00	0.63			
Bellsouth Corp.	51.25	-0.63			
Cabletron Systems	39.50	0.50			
Compression Labs Inc.	19.00	-1.00			
Conitel Corp.	41.00	0.00			
Data Switch Corp.	3.88	0.00			
Digital Comm. Assoc.	18.25	-1.50			
Dynastech Corp.	20.25	-1.00			
Florig Int'l Inc.	9.13	0.00			
Gandalf Technologies Inc.	3.13	0.00			
General Datacomm Inds.	3.00	-0.25			
GTI Corp.	31.25	0.38			
Infotron Systems Corp.	1.13	-0.06			
ITT Corp.	59.88	1.00			
MDI Communications Corp.	28.13	-0.25			
Microcom Inc.	6.00	0.75			
Network Equipment Tech.	8.00	0.00			
Network General	8.25	-0.50			
Network Systems Corp.	12.88	0.63			
Northern Telecom Ltd.	35.63	0.63			
Novell Inc.	15.00	-1.00			
Nyxnet Corp.	72.50	0.00			
Pacific Telesis Group	41.50	0.13			
Perrill Corp.	14.50	0.00			
Scientific Atlanta Inc.	14.88	0.25			
Southwestern Bell Corp.	52.88	-0.38			
United Telecom	28.00	0.00			
US West Inc.	37.13	-0.75			

Communications and Network Services			Off 0.68%		
Stock	52-Week High	Change	Stock	52-Week High	Change
3COM Corp.	8.50	+0.38	AT&T	37.38	-1.64
American Info Technics Corp.	63.75	+0.38	Commodore Int'l	15.86	-5.38
AT&T	37.38	-1.64	Micrograph	14.94	-14.18
Artel Communication Corp.	2.00	0.00			
Bell Atlantic Corp.	48.00	0.63			
Bellsouth Corp.	51.25	-0.63			
Cabletron Systems	39.50	0.50			
Compression Labs Inc.	19.00	-1.00			
Conitel Corp.	41.00	0.00			
Data Switch Corp.	3.88	0.00			
Digital Comm. Assoc.	18.25	-1.50			
Dynastech Corp.	20.25	-1.00			
Florig Int'l Inc.	9.13	0.00			
Gandalf Technologies Inc.	3.13	0.00			
General Datacomm Inds.	3.00	-0.25			
GTI Corp.	31.25	0.38			
Infotron Systems Corp.	1.13	-0.06			
ITT Corp.	59.88	1.00			
MDI Communications Corp.	28.13	-0.25			
Microcom Inc.	6.00	0.75			
Network Equipment Tech.	8.00	0.00			
Network General	8.25	-0.50			
Network Systems Corp.	12.88	0.63			
Northern Telecom Ltd.	35.63	0.63			
Novell Inc.	15.00	-1.00			
Nyxnet Corp.	72.50	0.00			
Pacific Telesis Group	41.50	0.13			
Perrill Corp.	14.50	0.00			
Scientific Atlanta Inc.	14.88	0.25			
Southwestern Bell Corp.	52.88	-0.38			
United Telecom	28.00	0.00			
US West Inc.	37.13	-0.75			

Computer Systems			Off 2.19%		
Stock	52-Week High	Change	Stock	52-Week High	Change
Alliant Computer Sys.	50.00	+29.31	Quantum Corp.	42.63	-16.42
System Center Inc.	29.31	+18.17	AT&T	37.38	-1.64
MAI Systems Corp.	18.17	+15.15	Commodore Int'l	15.86	-5.38
Advanced Micro Devices	15.15	+14.29	Micrograph	14.94	-14.18
Microcom Inc.	14.29				

Semiconductors			Off 3.81%		
Stock	52-Week High	Change	Stock	52-Week High	Change
Advanced Micro Devices	14.25	+1.88	AT&T	37.38	-1.64
Analog Devices Inc.	10.00	-0.38	Commodore Int'l	15.86	-5.38
Chips & Technologies	9.50	-0.25	Micrograph	14.94	-14.18
Intel Corp.	48.25	-2.00			
LSI Logic Corp.	10.75	-1.00			
Micron Technology	15.25	-1.50			
MIPS Computer Systems	8.88	-0.63			
Motorola Inc.	63.13	-1.38			
National Semiconductor	7.83	-0.13			
Texas Instruments	39.75	-1.50			
VLSI Technology	10.00	-1.13			
Western Digital Corp.	5.00	-0.50			

Peripherals & Subsystems			Off 4.58%		
Stock	52-Week High	Change	Stock	52-Week High	Change
Aperture Technologies	2.58	0.13	AT&T	37.38	-1.64
Banana Inc.	12.75	0.75	Commodore Int'l	15.86	-5.38
Cambridge Corp.	13.50	-1.25	Micrograph	14.94	-14.18
Cognitronics Corp.	9.25	-0.88			
Conner Peripherals	24.50	-1.38			
Datsaram Corp.	9.88	-0.38			
EMC Corp.	12.00	0.00			
Emulex Computer Co.	8.25	-1.00			
Evans & Sutherland	21.50	-0.25			
Iomega Corp.	5.44	0.00			
IFL Systems Inc.	26.25	0.00			
Master Systems	0.94	0.06			
Master Corp.	3.88	-0.50			
Microprose Corp.	1.88	-1.38			
3M Corp.	88.25	-8.88			
Printonix Inc.	9.25	0.25			
CMS Inc.	10.38	-1.88			
Quantum Corp.	13.63	-1.13			
Recognition Equipment	7.25	-0.13			
Raxon Inc.	10.38	-1.00			
Seagate Technology	11.88	-1.00			
Storage Technology	41.75	1.88			
Tandem Corp.	4.50	-0.31			
Tektronix Inc.	24.00	-2.00			
Video Systems	0.31	-0.03			
Xerox Corp.	57.63	-1.00			

Leasing Companies			Up 0.45%		
Stock	52-Week High	Change	Stock	52-Week High	Change
Amplicon Inc.	18.00	1.00	AT&T	37.38	-1.64
Comdisco Inc.	27.00	1.00	Commodore Int'l	15.86	-5.38
LDI Corporation	14.25	-0.13	Micrograph	14.94	-14.18
Selecterm Inc.	3.75	0.00			

## Novell

FROM PAGE 1

Network product manager at the company's Provo, Utah, headquarters. Edwards said Communication Services and most other products in Novell's Netware Version 3 line were designed to integrate existing and future products and standards.

A Netware user attending a recent Novell conference in New York expressed frustration that Novell internetworking software performance shortcomings were not being addressed. "Novell's T1 throughput falls short. We're getting into larger and larger data transfers, and Novell's T1 capability can't handle it," said Brian F. Pasch, senior communications engineer in the Information Technology Group at Goldman, Sachs & Co.

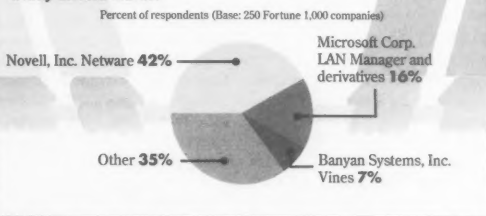
Novell added T1 support to its servers last year, a key move that Business Research Group in Newton, Mass., said prevented the vendor from losing customers to local-area network competitor Banyan Systems, Inc. Unlike Netware, Banyan's Virtual Networking System LAN was originally architected to embrace corporatewide networks spanning multiple sites.

Edwards said he had heard no complaints about the product's performance.

Novell's internetworking software has also received poor reviews from John Loo, head of technology development at \$7

## Network tug-of-war

Users' network installation plans over the next two years for local-area to wide-area network interoperability forecast a widely divided market



Source: Business Research Group

CW Chart: Tom Monahan

billion engineering and construction firm Fluor Daniel, Inc. in Irvine, Calif. Loo runs nearly 5,000 Novell nodes and said he is considering replacing Novell's dedicated interconnect software with Vitalink Corp. bridge/routers for "much more reliable throughput and connections."

Edwards said Netware v3.11 works well in less intense networks. It also works well in combination with high-speed dedicated routers.

Chandler said that for communications among Netware networks, Arco uses Cisco Systems, Inc. T1 links because Netware's dedicated interconnect software supports only Novell's proprietary protocols.

Novell hit a milestone when it announced a multiprotocol version of Netware in February that opens up the LAN to other networking environments and network management systems.

However, no corresponding upgrade has been made to its dedicated internetworking software.

Loo said Netware v3.11 thus does not address the interoperability problems he is experiencing. He said, however, that at the work-group level, Novell offers "enough functionality in terms of speed and convenience

## CHIEF AMONG SEVERAL managers' concerns is Novell's lack of a directory service to rival Banyan's Streettalk.

of local administration that we're willing to overlook some of the wide-area hassles." He stated that "it's certainly possible to use Novell as a wide-area vendor; we're doing it. But there's got to be an easier way."

Other users excited about the capabilities of v3.11 were less impressed with its accompanying price tag (see story at left).

"Novell needs to forge some alliances with workstation vendors so their workstations can run 3.11 server software," said Neville Pereira, supervisor of integrated computing environment at Ontario Hydro Research Division in Toronto.

Chief among several managers' concerns is Novell's lack of a directory service to rival Banyan's long-heralded Streettalk global service. Streettalk allows users to communicate directly with remote computers over wide areas without having to know and specify locations.

Novell's domain naming service, introduced this year, allows a user to access just eight servers at a time, and domains cannot overlap, Loo said.

Edwards said the naming service was designed to simplify the log-on process for managers and end users who must have access to a specific number of servers within a domain. To that end, Edwards said, "the naming service does a good job."

He added that Novell is considering opening the service enough to assign users access to servers in multiple domains.

# Novell readies revised end-user support plan

BY JIM NASH  
CW STAFF

Novell, Inc. is expected to announce tomorrow an end-user support program that will coordinate the technical staffs of several hardware and software vendors with networking products, according to industry observers.

Novell's support policy has been to discourage direct inquiries to the company, preferring instead that calls be made to resellers. The new program would come in the wake of growing dissatisfaction expressed by users of Novell and many other networking vendors.

Novell has refused to comment in any detail on the reports other than to say that executives have been previewing a new support setup with key customers.

Dave Vinzant, president of Vinzant, Inc., a reseller in Portage, Ind., said Novell is spearheading an effort begun one year ago to organize several networking hardware and software vendors into a support team.

Vinzant, as well as other resellers and analysts, said that under the program, managers calling one company with a problem that seems to be rooted in another

vendor's product will be handed over to that vendor. In some instances, support personnel from several companies would also hold conference calls with customers, he said.

Vinzant and another reseller, who requested anonymity, said Novell has deliberately waited until now because it feels it has gathered enough support partners. Although both resellers said Microsoft Corp.'s applications division recently signed on to the idea, a spokeswoman for Microsoft said she knew of no formal support agreements. "We would join," the spokeswoman said, "if we were approached."

Some network administrators said they are encouraged by the news. Managers must now deal with finger pointing by vendors and long minutes spent on hold, said Sally Hernandez, network systems specialist for the city of Fresno, Calif.

Frank Goodyear, leader of the Orange County Netware Users' Association, said he was less impressed with the plans. "Basically, [vendors] will be able to pass the buck a lot faster," said Goodyear, who is president of Ostech Consultants.

## Piggy-bank buster

For the U.S. Environmental Protection Agency (EPA), Novell's February announcement of an "enterprise" version of its Netware network operating system — v3.11 — was a mixed blessing.

The EPA runs 190 Novell servers, as well as some Decnet protocols in its research and development division, so the heterogeneous capabilities of v3.11 were the good news. The bad news was that v3.11's cost structure "priced Netware out of our market," said David A. Bittenbender, chief of the telecommunications group at the EPA's central data processing center in Research Triangle Park, N.C.

Bittenbender said v3.11 boosted some product prices "300% to 400%," adding that it would cost the agency "about \$1 million" to upgrade to v3.11. Many of the agency's Netware networks are still running Netware 286 versions, which receive no upgrade price breaks.

The agency had standardized on Netware over Token Ring and "had no reason to look at anything else until this price increase," which happened during the agency's 1993 budget process, Bittenbender said. "We can't afford v3.11 plus network management, so we're rethinking our Netware application."

Bittenbender said v3.11's Transmission Control Protocol/Internet Protocol (TCP/IP) support is particularly attractive in light of the requests for proposal he has for two TCP/IP-speaking supercomputers. "It's too bad not to be able to take advantage of great technology because you can't afford it," he said.

Netware v3.11 started shipping in March. Prices are \$3,495 for a 20-user version, \$6,995 for a 100-user version and \$12,495 for a 250-user version.

Until Sept. 30, Netware v3.0 and v3.1 customers who purchased their software before Novell's February announcement can get upgraded to v3.11 for free.

JOANIE M. WEXLER

## Toward total LAN control

Bytex claims 99.9% uptime with intelligent hub

BY JOANIE M. WEXLER  
CW STAFF

SOUTHBORO, Mass. — Bytex Corp., a major player in fault-tolerant communications, said it will announce today an intelligent hub that makes mission-critical applications running on local-area networks less vulnerable.

The company, long profitable with its high-end matrix switches that help prevent host-based communications from faltering, will apply fault tolerance to LANs with an intelligent wiring concentrator dubbed Maestro.

The move aims to address user concerns over network uptime during an era when many are downsizing from costly mainframe computing power to networked personal computers and workstations.

"There is an incredibly high growth curve in corporate America for putting mission-critical applications on LANs," said Cheryl Currid, president of consulting firm Currid & Co. in Houston. Until two months ago, Currid ran 1,000 LAN nodes at Coca-Cola Foods, where LANs are viewed "as a corporate utility and installed in a mission-critical way," she said.

Maestro will increase LAN uptime to 99.9%, Bytex said. A switching function will allow centralized control of growing networks by allowing network administrators to swap stations and file servers from one Token Ring LAN to another remotely from a central management station. That, according to Bytex, will eliminate time-consuming trips to the wiring closet to re-patch cables — a main contributor to the average 6% downtime LANs now experience.

"To us, Maestro's main advantage is the ability to switch test equipment in and out of different LANs remotely and perform networkwide diagnostics from one spot," said Anthony J. Casciotti Jr., an assistant vice president at National Westminster Bank in Melville, N.Y. Casciotti runs 40 departmental LANs in 25 buildings and said he will start beta-testing Maestro in about one week.

Other hubs, such as Synoptics Communications, Inc.'s Lattisnet, allow users to disable stations remotely but still require a physical trip to the wiring closet to move or reconfigure users, Casciotti explained.

## NEWS SHORTS

**Group blasts credit reports**

Nearly half (48%) of the 161 computerized credit reports reviewed by the Consumers Union contained inaccurate information, and 19% had "major" credit-related errors, the nonprofit publisher of *Consumer Reports* magazine said last week. The American Financial Services Association called the study "rubbish" because of its small sample and said any consumer database is bound to have some minor errors. But U.S. Rep. Esteban E. Torres (D-Calif.) said he was shocked by the findings and scheduled a June 11 hearing to consider legislation to increase the accuracy and privacy of credit databases.

**Apple frets over third quarter**

Demand may be strong for Apple Computer, Inc. Macintosh computers, but that does not translate into greater profits, according to Apple officials. Apple Chief Financial Officer Joseph A. Graziano said last week that signs in the first month of Apple's third fiscal quarter indicate the company faces a quandary similar to what happened three months ago when unit shipments were up but gross margins were down.

**Toshiba chops prices**

Toshiba America Information Systems, Inc. cut prices across its entire line of portable computers last week, including a \$1,600 price cut on the T2000SX/20, its Intel Corp. 80386SX-based notebook. The price cuts affected 17 models, from its T5200C color laptop down to its T1000 notebook, which now sells for \$799.

**Legent, Software AG pair up**

A joint development agreement was announced last week partnering Software AG of North America, Inc. and Legent Corp. to produce an interface between their change management software products. It will let Software AG's Predict Application Control and Legent's Endeavor/MVS products work together, giving users consistent management over applications built with Software AG's Natural fourth-generation language.

**Marcam buys financial line**

Marcam Corp., which sells manufacturing software for IBM computers, announced last week that it will acquire marketing and support rights to J. D. Edwards & Co.'s financial applications, which run on IBM Application System/400s. Marcam will integrate business applications from J. D. Edwards, including general ledger, accounts payable and report writer, into its process manufacturing software.

**Memory for rent**

When times get tough, users lease, according to computer industry lore. Memory vendor Cambex Corp. has a new take on the old saw: When times get *really* tough, users rent. Last week, Cambex announced what it said is a first: a memory rental program aimed at IBM high-end mainframe users, particularly the approximately \$50 billion System/3090 installed base. Cambex will rent either its own or IBM's central and expanded memory for terms of 90 days and more at approximately 35% less than the comparable purchase price.

**CGI buys Transform Logic products**

CGI Informatique, a French software giant, said last week that it had reached a tentative agreement to acquire several upper CASE products from Transform Logic Corp. in Scottsdale, Ariz., for an undisclosed sum. The personal computer-based products, Designaid II, Lifecycle Manager and Source/RE CASE, aid in automating the planning and analysis portions of the software life cycle. They would complement CGI's PC-based Paclan and mainframe-based Pacbase computer-aided software engineering (CASE) tools, CGI said. Transform Logic, which is for sale, sold the products to raise capital, company sources said, noting that Transform Logic will continue to sell and maintain its code-generation products.

## NCR promises Tower line lives

Users claim product line abandoned for Intel-based System 3000

BY MICHAEL FITZGERALD  
CW STAFF

SAN ANTONIO — Conventional wisdom held that NCR Corp. would kill its Motorola, Inc. 68000-based Tower line of minicomputers after it announced its System 3000 strategy, based on Intel Corp. microprocessors. But at the NCR Users Conference (Nucon) here last week, the Tower appeared to get a reprieve.

Several NCR representatives, both in panels and on the show floor, denied that the Tower line was dead and said it would be upgraded and enhanced as long as there was user demand and as long as Motorola continues to enhance the chip family.

A panel on Unix, in particular, drew fire from users unhappy with NCR over what they called its orphaning of the Tower.

"It seems like they're abandoning the Tower users and the

Tower — they're pretty much going away from small business in general, the way I see it," said Carl Baron, technical support manager at Millstone Coffee, Inc., which last year bought a Tower 32/825 and NCR personal computers.

**Disgruntled user**

Baron said the 68040 expansion was a solid upgrade option, but he felt "misled" by NCR's sales efforts last year. "I'm real grim about the third-party software that'll be created for the Tower in the future," he said.

Away from Nucon, NCR is coy about its plans for Towers based on versions of the 68000 beyond the 68040, other than to say it will not put AT&T Unix System V Release 4 on the Tower. A spokesman refused to comment on what might happen after the release of this year's 68040-based Tower products: the 32/750 in July and the Tower

**Tower shakes**

NCR Corp.'s bold strategy has caused some nervousness among the large installed base of Tower minicomputer users

1990 world-wide figures for 32-bit Tower machines

Shipments 7,762

Installed base 62,279

CW Chart: Doreen St. John  
Source: International Data Corp.

32/825 and 32/850 multiprocessor versions.

Still, David Wightman, systems programming manager at the California Insurance Group in Monterey, Calif., said his firm would move to the System 3000 in the future.

## REPORTER'S NOTEBOOK

Intel Corp.'s 50-MHz I486 microprocessor, the current cornerstone of NCR Corp.'s System 3000 strategy, is expected to be announced next month, according to some sources at Nucon. Intel will only confirm a summer release date for the chip. Sources close to NCR also said Intel will release a 66-MHz version of the I486 before the end of 1991.

One source close to NCR reported NCR employees were jubilant on April 15 for reasons that had nothing to do with taxes. That was the day NCR got software to run on a four-processor prototype of its 3550, which is expected by some beta testers within the month and due for

delivery late in the third quarter.

NCR's stylus-based computer, expected to be released in September, will be based on Intel's 80386SL power management chip, but several NCR speakers, including President Gilbert Williamson, said it will be SX-based, causing even the notepad's product manager to wonder briefly if development plans had been changed without his knowledge.

At least one vendor in the exhibit area near Nucon was preparing for the NCR/AT&T merger by giving away AT&T cordless telephones to attendees.

## Employees, users tire of AT&amp;T/NCR discord

BY MICHAEL FITZGERALD  
CW STAFF

SAN ANTONIO — The question was asked on the Riverwalk here last Monday: Did Gil Williamson bring his AT&T speech or his System 3000 speech?

Williamson, NCR Corp.'s president, brought the System 3000 speech for his keynote address at the NCR Users Conference (Nucon). AT&T's takeover effort was not mentioned until a user stood up afterward to ask Williamson for an update, drawing applause from the audience and a terse response from Williamson: "I have no developments to report other than what's been in the papers."

Last week, the papers simply reported the joint AT&T/NCR

announcement on April 28 that progress had been made and NCR's board had expanded to 14 members, reinstating Chairman and Chief Executive Officer Charles E. Exley Jr. as well as Williamson.

"We felt it prudent to have the CEO and the president of the company on its board in this critical time," NCR spokesman Mark Feighery said. Exley and Williamson were due to be replaced last Wednesday by AT&T candidates elected at NCR's annual meeting March 28.

Williamson, at a reception for user group management, implied that NCR has battled so doggedly against AT&T in part because it wanted to get its open, cooperative computing products well under way before

having to deal with a merger.

"When this first happened," Williamson said, he and Exley "went to the board and said, 'We're out of cycles here. We're out of brains; we don't have any one to spare for this.'"

**Get it over with**

The consensus at Nucon was that users and NCR employees would like to see this deal done. "We're all just sick of it," said one high-ranking NCR official, who added that some NCR sales representatives have placed bets as to how long it will take a customer to ask about the AT&T situation.

Some users would like to see the merger occur because they think it will benefit them. Robert L. Merrick, MIS director at Windmere Corp., an 18-year NCR user, said he expects improved software and telecommunications benefits.

"NCR's always had superior hardware but lacked software," Merrick said.

## DOS 5.0

FROM PAGE 1

"It looks like a winner," said Earl Robinson, a telecommunications consultant in New York who has worked with the new system since last fall.

Insiders said the extraordinarily large beta-test group — most beta tests consist of approximately 100 sites — resulted from the plethora of software incompatibility complaints about the IBM-produced DOS 4.0. The bugs were eliminated when Microsoft later reworked the code into DOS 4.01, but the prestige of DOS took a hit and many users stayed with the earlier DOS 3.1 and 3.3 releases.

"Microsoft's reputation was on the line with DOS 5.0 — they

want it right the first time," a software dealer in Atlanta said.

Beta-test users said the new operating system offers a reworked graphical shell as well as an array of built-in utilities from Central Point Software, Inc.'s PC Tools application (see story page 12) including backup, file mirror, undelete and unformat features.

The result is a system that offers much of what you get with OS/2 for the price and compatibility of DOS. "DOS 5.0 is certainly a worthy competitor to OS/2," said Joel Diamond, technical director of the Windows Users Group Network in Media, Pa. "There is a lot of competition between the DOS and OS/2 development groups at Microsoft — [Chairman] Bill Gates likes to see that."

The refurbished DOS begins with a menu system that allows the selection of a series of installable components, including a menu shell, character-based file system and task switcher. If all features are selected, DOS 5.0 will require as much as 3M bytes of disk space — 1M byte more than OS/2 1.3 requires.

## Third-party punch

Disk space can be regained, however, by deleting the older replaced utilities — something that is worrying utilities makers who are already scrambling to respond: Symantec Corp. is reportedly beefing up its best-selling Norton Utilities with an upgrade planned for the third quarter. "No doubt about it: DOS 5.0 is going to take a punch out of the third-party utility mar-

ket," said Paul Cassel, a computer consultant in Albuquerque, N.M.

Some beta-test users, however, chose to skip the new utilities. "I like to stick with as many of my tried-and-true utilities as possible [to] avoid having to start at the bottom of the learning curve again," said one user, who requested anonymity because he had signed a nondisclosure agreement.

DOS 5.0 also includes an option that allows it to be loaded into upper memory — an area between 640K bytes and 1M byte that is typically unused or relegated to features such as video device drivers — with memory management built in. Previously, users needed to employ products such as Quarterdeck Office Systems, Inc.'s QEMM

and 386Max from Qualitas, Inc. in order to achieve those same results.

The update can also be loaded into high memory, the 64K chunk of memory right above 1M byte. Because this capability frees up more conventional memory, the payoff for Windows users is about a 10% increase in speed. An improved File Allocation Table that can be read by pre- and post-4.01 disk utilities and recognized by OS/2 is also included.

Beta-test users were generally pleased with the initial high quality of DOS 5.0. "One of the objectives of beta-testing is to eliminate features that just can't be made workable, and there just didn't seem to be that many bad apples," one St. Louis-based user said.

## OS/2 migration not for the squeamish

Uncertainty over IBM's New Technology OS/2 clouds desktop migration

## ANALYSIS

BY PATRICIA KEEFE  
CW STAFF

Here are two words of advice for those trying to craft a long-term strategy for migrating mission-critical applications to the desktop: Good luck, especially if your plans involve OS/2.

Three weeks ago, IBM went all out to convince users and developers that it is committed to OS/2. And it is — at least with regard to the forthcoming 32-bit version, Release 2.0.

Yet no sooner did IBM clear up questions about the capabilities and viability of OS/2 2.0 than the haze of uncertainty shifted to cloud the next planned generation of OS/2, the 32-bit — but portable — New Technology under development at Microsoft Corp. Last week, Lee Reiswig, IBM's assistant general manager of programming and personal systems, promised to outline IBM's position on New Technology either late this year or early next year.

This time frame means that corporate developers, some of whom have had a tough time defending their support for OS/2, cannot present a game plan that extends beyond the end of 1992. Strategic plans typically cover at

least five years, Reiswig said.

The New Technology system, which can be cross-licensed, is slated to ship in 1993; the developers' kit should ship by year's end. In the meantime, New Technology, also called OS/2 3.0, will probably come under assault before ever reaching the alpha-testing stage.

## Competition from within

Competition may come in the form of a separate effort by IBM, which may combine OS/2 and Unix, Reiswig said. It will come from Unix System V Release 4.1. Also known as Unix Easy, this next-generation follow-on to the current System V Release 4.0, is described as modular, smaller, faster and easier to use. A desktop version is slated to ship either late this year or in early 1992, said Roel Pieper, executive vice president of sales and marketing at Unix System Laboratories, Inc.

While Pieper moves to protect the rear, IBM is having second thoughts about where Microsoft is taking New Technology. Both IBM and Microsoft have acknowledged that the two could go separate ways on a portable OS/2 platform.

Reiswig and IBM General Manager Joseph Guglielmi confirmed that IBM has been send-

ing out signals during the last six weeks indicating a lessening of support for New Technology.

"We are keeping our hand in a number of [portable platform] efforts. New Technology OS/2 has a long way to go before it's cooked, so we need to have alternatives available," Reiswig said.

Kernel technology such as the Open Software Foundation's OSF/2, now under development, might prove to be a viable tool for porting OS/2 to other platforms, they said. "There could be a convergence; we could bring the Unix and OS/2 worlds together on one common world," Reiswig said.

"In this scenario, IBM would take selected components of OSF/2, like the distributed computing environment and the remote procedure calls, and put them into OS/2," said John Dunkle, a consultant at Workgroup Technologies, Inc. in Hampton, N.H.

IBM's hesitancy has not escaped Microsoft's notice. "Yes, there has been a lessening of support [on IBM's part]," said Steve Ballmer, senior vice president of system software, calling IBM's hedging on New Technology another manifestation of IBM's viewpoint that it will not depend on another company for technology.

## System 7.0

FROM PAGE 1

Jim Poyner, an analyst at research firm William K. Woodruff & Co. in Dallas.

Several users praised a Help feature that opens an information balloon at the click of a button. It's "especially useful for applications used only occasionally," said one user, who is an official at the National Aeronautics and Space Administration (NASA). He also said a feature allowing file sharing without a server is helping NASA scientists at different sites collaborate on research papers.

Others praised the ease of updating. The upgrade can be downloaded to all Macintoshes on the network, so there is no need to carry a floppy disk to all units. "Apple is doing a good job of getting it into our hands; it's very easy to update a large group of users," said a U.S. Army officer at a press briefing in Washington, D.C., last week.

While many Macintosh users carp about the delay, many others who have seen prerelease versions praised the new system for its ability to integrate significant additions without adding undue complexity. "It's a major upgrade, but it doesn't seem dramatic, and that's to its credit," said Craig Danuloff, author of *The System 7 Book* and several other Macintosh-related publications. "System 7.0 has a lot of subtle conveniences, and that's what makes it very nice to work on."

System 7.0 also presents Apple with a curious corporate discrepancy. Although Apple executives have strenuously affirmed their commitment to the low end of the Macintosh line, System 7.0 memory requirements are

not exactly entry-level: A hard drive, at least 2M bytes of random-access memory and 3M bytes to 5M bytes of hard disk space are suggested to use System 7.0 and all of its related files.

One factor in Apple's favor is the decreasing price of add-in memory: An additional 1M byte of RAM can be purchased for as little as \$35, according to Danuloff. Still, he conceded, there is a natural aversion to the upgrade process. "People think that they

## Inside the Macintosh

System 7.0 highlights:

TrueType — an alternative to Adobe Systems, Inc. Postscript.

Virtual memory — allows users to create RAM using free space on their hard disk.

Multitasking.

32-bit addressing.

Aliasing — creates duplicate icons for any file, folder or volume, easing file management and tracking.

Help balloons — simple explanations of commands, dialog box options and on-screen icons.

CW Chart: Doreen St. John

have to open up the machine or lug it down to the dealer, and it scares them away," he said.

System 7.0 could help Apple on the corporate front by shoring up its defenses against Windows. Users said many of the new features strengthen their commitment to Apple. "Adding features like multitasking [to the Macintosh operating system] is another reason why there still is no comparison between Apple and Windows," said James Brown, systems specialist at Nissan Motor Corp. in Carson, Calif.

A \$99 System 7.0 personal upgrade kit will include 90 days of toll-free telephone support. A \$349 group update kit will include 180 days of free telephone support.

Senior Correspondent Gary H. Anthes contributed to this report.

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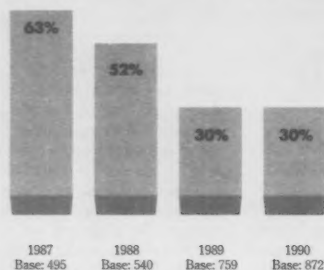


MANUFACTURING INFORMATION SYSTEMS

Manufacturing IS executives see a growing role for automation but admit that the technology implementation is relatively slow

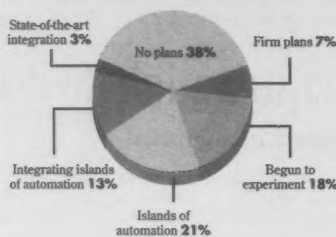
"Does technology yield benefits?"  
Percent indicating significant benefits

Only 30% of U.S. manufacturers feel they're getting benefits from technology, compared with 63% claiming positive results in 1987



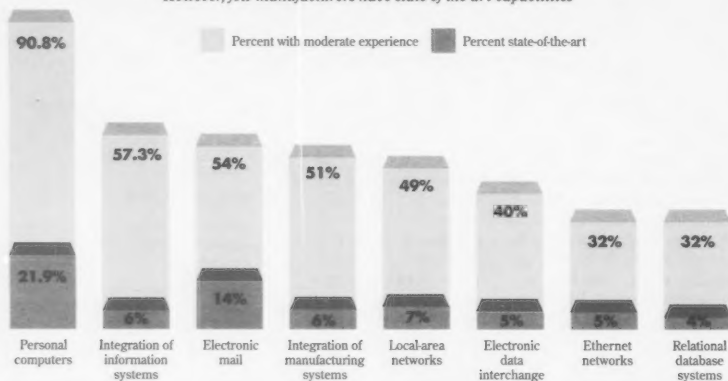
Status of adoption of computer-integrated manufacturing  
Percent of respondents (Base: 872)

More than one-third of the manufacturers surveyed have no plans for computer-integrated manufacturing, but many agree they are well on their way



Information technologies in use  
Percent of respondents (Base: 872)

Experience with technology has increased slightly since last year, particularly for PCs. However, few manufacturers have state-of-the-art capabilities



Source: Deloitte & Touche, Chicago

CW Chart: Tom Monahan

NEXT WEEK

Once high-flying Pan Am is now under Chapter 11 bankruptcy protection, and IS has felt the hit. Cutting costs, upholding employee morale, postponing projects — all this has accompanied a shift from strategic to tactical IS. Vice President of Information Services Robert O. Wagner shares these challenges and more in Manager's Journal.



Jochen Stein

Next week, In Depth kicks off its roundtable series on how vertical industries are assessing the value of IS spending. Insurance industry IS chiefs reveal that while they can justify what has already been spent on technology, they find it difficult to gauge how much bang they will get from the next buck spent on new systems initiatives.

INSIDE LINES

Old hackers go to corporate heaven

► An ex-hacker reported last week that the Legion of Doom, perhaps the most notorious hacker group to have operated in this country, is now defunct. Our contact said the remaining two or three members have set up a security consulting practice to advise on how to protect against outlaw hackers.

It's in the mail!

► A *Computerworld* reporter found himself in the uncomfortable position last week of being the first to inform William Cook, an assistant U.S. attorney in Chicago, that Cook had been named in a civil lawsuit by the Electronic Frontier Foundation (EFF). Cook has spearheaded the government's campaign to rein in computer users suspected of illegal activity. When told that Cook had not been served papers in a timely manner as legal protocol mandates, members of the EFF said they had sent the documents to the wrong office.

Blue-light special

► IBM will announce a slew of price cuts and performance boosts tomorrow for its RISC System/6000 Unix-based workstation and server line, sources close to the company confirmed last week. Price reductions from 25% to 40% are expected across the product family, along with software upgrades that improve performance. No new models or hardware changes are in the cards yet, however.

For the people, by the people?

► Free-lance computer contractors — programmers hired to work on troubled computer projects — are not happy with the way Congress passed legislation eliminating the federal requirement for 150% overtime pay. The provision was attached to a bill dealing with the American Samoa tuna industry, with no hearings or testimony from the working class. Dennis D. Leonard of Brainerd, Minn., said in a letter to the U.S. Department of Labor: "I don't think a law of this magnitude should be passed as an amendment to a law concerning Samoan fishermen. How can you expect us to respect you, the government, when you pull stuff like this? What is next? A mandatory report date for installation of manacles and chains?"

IBM problems? Form a committee

► A group of third-party outsourcing vendors met last week at the Adapso conference in Miami and formed a committee to gather information on whether IBM's outsourcing practices amount to an arguable consent decree violation. Affiliated Computer Services Chairman Darwin Deason had previously charged such violations. The committee's report is due by the end of June; the final decision on whether to call in the federal authorities is expected by the end of July.

And they said it could never be done!

► IBM told *Computerworld* it will live up to its promise to protect customer investments in the IBM Type 2 cabling system by soon providing 100M bit/sec. data rates over Type 2's shielded twisted-pair medium. IBM said it will deliver those data rates — specified in the FDDI standard, which uses glass fiber as a medium — over Type 2 shielded copper during the same time frame that it rolls out its FDDI products. In September 1990, IBM said its multiprotocol 3172 controller would have an FDDI adapter by December 1991 and its deadline for a RISC System/6000 FDDI adapter is February 1992.

Just the facts, please

► International Data Corp. (IDC) estimated that Next has sold 15,000 machines since its inception, not 4,000 as was reported here last week. The latter figure referred to IDC's estimate of Next's first-quarter shipments.

*Know any leading-edge open systems users? If so, an award selection committee sponsored by the Unix Expo trade show wants to know who they are. The award, to be given out at the show in late October, will be presented annually to the organization "that best exemplifies, illustrates or advances the cause of open systems." News Editor Pete Bartolik is among those collecting nominations, so contact him at (800) 343-6474, fax a summary to (508) 875-8931, or drop a line on CompuServe at 76537,2413.*

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